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FINAL WORK PLAN, BASEWIDE RADIOLOGICAL SUPPORT

10/23/2017

APTIM FEDERAL SERVICES, LLC

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Naval Facilities Engineering Command Southwest
San Diego, CA

Final
Work Plan

Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

October 2017

APTM-0006-4550-0008

Naval Facilities Engineering Command Southwest
San Diego, CA

Final
Work Plan

Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

October 2017

Lisa Bercik, PE, QSD, QSP
Project Manager

October 23, 2017
Date

Prepared for NAVFAC Southwest by
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Contract Number: N62473-17-D-0006
Contract Task Order: N62473-17-F-4550
Document Control Number: APTM-0006-4550-0008

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Acronyms and Abbreviations

AMS	*APTIM Management System*
APTIM	Aptim Federal Services, LLC
HPNS	Hunters Point Naval Shipyard
IR	Installation Restoration
MOU	Memorandum of Understanding
Navy	U.S. Department of the Navy
RASO	Radiological Affairs Support Office
RCT	radiological control technician
RPP	*Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California*
RWP	radiological work permit

1.0 Introduction

Aptim Federal Services, LLC (APTIM) has been contracted by the Naval Facilities Engineering Command Southwest to provide basewide radiological support at Hunters Point Naval Shipyard (HPNS), located in San Francisco, California (Figure 1), under APTIM's U.S. Nuclear Regulatory Commission License 20-31389-30 and California Agreement State License Broad Scope Radioactive Material License 7889-07. APTIM will maintain radiological controls and postings throughout the base, ensure radiation protection to those at the base, and support other contractors completing chemical removal and remediation work in radiologically impacted areas. A Memorandum of Understanding (MOU) among the contractors working on radiologically controlled sites at HPNS helps to define APTIM's role and responsibilities for basewide radiological support under this task order. Figure 1 depicts the current radiological areas under contract. The MOU will be revised and updated if radiological boundaries change or individual contractor responsibilities change.

The work presented herein is authorized under the U.S. Department of the Navy (Navy) Contract No. N62473-17-D-0006, Contract Task Order N62473-17-F-4550. This Work Plan describes the technical approach that will be implemented to provide basewide radiological support according to the Navy Statement of Work. In general, basewide radiological support includes the following:

- Performing routine surveys of radiologically impacted buildings and sites
- Maintaining basewide radiological postings and controls for radiologically impacted areas and radiological work areas
- Providing site-specific radiological training for visitors or contractors working in radiologically impacted areas
- Providing radiological screening and sampling to contractors performing non-radiological work in a radiologically impacted site
- Operation and maintenance of a radiological portal monitor and tire truck wash for incoming and outgoing trucks
- Other support activities to be performed as needed

Work performed under this Work Plan will follow the provisions of the *Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California* (RPP; APTIM 2017a) and the project *Accident Prevention Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California* (APTIM, 2017b).

1.1 Project Organization

Figure 2 presents the project organization and APTIM points of contact for this project.

1.2 Project Schedule

The project schedule is presented as Figure 3.

1.3 Work Plan Organization

This Work Plan is organized into the following three sections and five appendices:

- Section 1.0, "Introduction"—Provides the project team organization, project schedule, and Work Plan organization.
- Section 2.0, "Basewide Support Activities"—Provides an overview of planned support activities.
- Section 3.0, "References"—Includes a list of documents used to compile this Work Plan.
- Appendix A, "Waste Management Plan"—Describes the waste sampling design and rationale; laboratory analyses; sampling methods and locations; and sample frequency.
- Appendix B, "Abbreviated Sampling and Analysis Plan"—Addresses the specific analytical requirements for soil and water samples required to support non-radiological contractors.
- Appendix C, "HPNS Basewide Stockpile Inventory (as of September 21, 2017)."
- Appendix D, "Contractor Quality Control Plan"—Addresses lines of communication, technical review procedures, activity documentation, definable work features, quality control staff and their responsibilities, proposed outside organizations (vendors, subcontractors) and their responsibilities and reporting requirements, project inspection requirements, required submittals, and other procedures to be followed to ensure technical quality throughout the project.
- Appendix E, "Project Work Instructions"—Includes current and relevant project Work instructions that have been prepared for the basewide radiological support task.

2.0 Basewide Support Activities

The following subsections summarize the radiological support activities to be performed for Contract Task Order N62473-17-F-4550. Detailed information on the procedures described in the following subsections is provided in the appendices as noted.

2.1 Portal Monitor Operation and Truck Wash

APTIM will maintain and operate the portal monitor (Ludlum Model 3500-1000) for incoming and outgoing trucks loaded with both radiologically and non-radiologically contaminated soil and debris. The purpose of the portal monitor scan is to prevent the inadvertent shipment of materials or equipment exhibiting elevated radiation levels on to or off of HPNS. Hand screening may be required in instances when the portal monitor malfunctions or is unavailable. Portal monitor and supplemental hand surveys will be conducted in accordance with *APTIM Management System* (AMS) procedure AMS-710-07-WI-40115, "Screening of Trucks Using Stationary Portal Monitor and Portable Survey Instrumentation" (APTIM, 2017c). Loads that fail the portal monitor or hand scan will be escorted by a radiological control technician (RCT) back to the contractor who generated the soil, or will be dumped and radiologically screened in a controlled area. Additionally, the Base Realignment and Closure Caretaker Site Office Activity point of contact, the Navy Remedial Project Manager, and Radiological Affairs Support Office (RASO) will be notified immediately (same day) if a load fails. A project work instruction for the portal monitor is included as Appendix E.

APTIM will provide a monthly summary report of the portal monitor usage and activities. The report will include the origin of the load, information whether the load passed or failed the portal monitor and support hand screening documentation (if necessary), and a quantification of net increase in portal monitor alarms as compared to the previous month.

APTIM will maintain a truck wash during large scale hauling events. The truck wash will be operated in conjuncture with operation of the portal monitor and will help reduce truck track-out. If the truck wash is not operational or during periods of minimal waste hauling, truck tires may be hand-spray to remove dirt and dust instead.

2.2 Radiological Controls and Postings

APTIM will implement and maintain radiological controls for radiologically impacted areas that are not covered by an on-site radiological remediation contractor according to the current MOU, which will be posted within the on-site trailer. Sites will be posted according to existing radiological conditions. Radiological postings will be placed and maintained every 15 meters along perimeter fencing for radiologically impacted sites. Postings and fencing will be inspected on a minimum quarterly basis. Additional fencing will be procured and set up as needed.

Radiological controls and postings are further described in Section 14 of the RPP (APTIM, 2017a) and AMS-710-07-WI-04015, “Radiological Labeling, Postings, and Access Control” (APTIM, 2017c).

APTIM will assume the radiological controls of the following areas:

- Radiological Screening Yard 3 in Parcel E
- Installation Restoration (IR)-02 and IR-03
- IR-12 (Salvage Yard)
- Concrete pad adjacent to Building 224
- Building 258 Sample Storage Area
- Trevet Bulk Storage Tank (Baker Tank)
- Portal Monitor
- Area near Buildings 204/205 between Dry Docks 2 and 3

Changes (additions or removals) to the list above will be documented in an updated MOU.

2.3 Radiological Surveys

Routine weekly, monthly, and quarterly surface surveys will be performed for those areas that are radiologically impacted at HPNS, but not currently controlled by another licensed radiological contractor. Surface surveys will cover radionuclides of concern for each site. Survey activities include dose monitoring, and the collection of swipe samples and static measurements. The main purpose of the surveys is to ensure that there is no change in dose reading at the perimeter that could negatively impact the public or environment and to ensure security measures are in place. Routine surveys are discussed further in the RPP (APTIM, 2017a) and will be documented in a project work instruction. Routine surveys include building surfaces and land areas.

2.4 Stockpile Tracking

APTIM will maintain a basewide tracking table of waste piles within the radiologically controlled areas and impacted areas at HPNS. The current version of the table (as of September 21, 2017) is provided as Appendix C. Information from other contractors performing radiological work at HPNS will be consolidated and updated on a regular basis. The radiological status of the waste piles will be verified at a minimum of every two weeks.

2.5 Radiological Support to Other Contractors

Prior to providing radiological support to other contractors, the Radiation Safety Officer will review the proposed scope of work and determine the level of effort needed by APTIM to provide coverage for the work activities. The Radiation Safety Officer will identify potential radionuclides of concern for the work area and determine the appropriate level of control. APTIM will develop project work instructions as needed and submit to RASO for review and concurrence prior to the start of fieldwork.

Radiological support and supervision of non-radiological contractors performing work in radiologically impacted areas (Figure 1) that are not currently under the license control of another contractor will be provided by qualified APTIM RCTs. At a minimum, the support includes radiological training and escort into and out of an impacted area. The radiological technician assigned to this task must ensure personnel entering and exiting the impacted areas are properly trained, briefed, supervised, and scanned for radiological contamination upon exiting the site per U.S. Nuclear Regulatory Commission license requirements. Additionally, if the contractor is performing intrusive work, surveys of equipment may be required during work efforts.

APTIM will perform radiological sampling and laboratory analysis (as required) in the event that a non-radiological contractor has to perform intrusive activities in an impacted area. Prior to the start of fieldwork, the contractor will submit their scope of work for review and APTIM will develop project work instructions, which will be reviewed by the Navy and RASO prior to the start of fieldwork. Details on the soil sampling approach and analyses are provided in Appendix A (Waste Management Plan), Appendix B (Abbreviated Sampling and Analysis Plan), and/or summarized in task-specific work instructions.

APTIM will implement task-specific tailgate briefings for assigned tasks which will be led by the Project Radiological Safety Officer Representative and provide an opportunity for both radiological technicians and field personnel to ask questions. APTIM will work closely with the Navy and other HPNS contractors to forecast upcoming field needs, field scheduling, and training at HPNS. APTIM will organize and facilitate weekly field calls with the Navy and RASO during periods of increased fieldwork.

2.6 Radiological Awareness Briefing

APTIM will conduct radiological awareness briefings for non-radiological remediation contractors executing work in radiologically impacted areas and requiring an escort. Briefings will be specific to the area(s) of concern where access is needed, but will cover the following at a minimum:

- Applicable portions of Title 10 Code of Federal Regulations 19, Title 10 Code of Federal Regulations 20, the RPP (APTIM, 2017a), radiation work permits (RWPs), site-specific reference documents (e.g., historical radiological assessment), and supporting standard operating procedures
- Alpha, beta, and gamma emitting radionuclides
- A description of radiation exposure risks and monitoring requirements
- Access and egress protocol specific to the radiologically impacted location(s) requiring entry
- Radiation exposure reduction techniques for an embryo/fetus
- Completion of applicable briefing/exposure monitoring documentation
- Notification of contacts as needed to complete training requirements

Prior to entry to an impacted area, APTIM will ensure non-radiological remediation contractors entering the area have the required dosimetry (if necessary), have completed the radiological awareness briefing, and have been briefed on the requirements established in the RWP in accordance with applicable standard operating procedures. Persons entering an impacted area will sign in and out on an access log and comply with requirements established in the RWP. In addition, personnel exiting an impacted area will be subject to a personnel survey by an RCT.

2.7 Incoming and Outgoing Surveys

Equipment and materials brought into radiologically impacted areas controlled by APTIM will be subject to an incoming survey by an RCT prior to entry into the controlled area. Surveys of incoming equipment will be performed in accordance with AMS-710-07-WI-04012, “Radiological Surveys and Monitoring,” and AMS-710-07-WI-40121, “Performing and Documenting Radiation and Contamination Surveys” (APTIM, 2017c). During these survey activities, accessible surfaces will be surveyed for removable and fixed surface contamination and the results documented. An equipment tracking log will be maintained for equipment entering and exiting radiologically impacted areas.

2.8 Radioactive Check Sources

As part of the basewide radiological program, APTIM will provide and maintain radioactive check sources which will be used in source leak testing and calibration of on-site radiological survey instruments and the portal monitor. APTIM will properly store and control the radioactive check sources per applicable state and federal radiation licenses.

2.9 Personnel Dosimetry

As part of the radiological health and safety program, occupational whole-body radiation exposures will be monitored, tracked, and recorded. APTIM will provide non-radiological remediation contractors working in impacted areas with personal dosimetry. In addition, basewide support personnel entering or surveying impacted areas will wear personal dosimetry. Visitors entering impacted areas under RCT escort do not require dosimetry as long as they do not perform or supervise hands-on work. Examples include site walks, surveying, utility marking, and other short-term periodic visits.

Only National Voluntary Laboratory Accreditation Program-approved dosimeters from a National Voluntary Laboratory Accreditation Program-certified provider will be used. Records will be maintained according to APTIM recordkeeping procedures. Dosimeters will be read on a monthly or quarterly basis, depending on the exposure risk and/or duration of the contractor's work activity. Dosimeter results will be provided to the contractor health and safety representative.

2.10 Work Instructions

APTIM will develop work instructions, on an as-needed basis, for task-specific activities that require radiological oversight. Work instructions will be reviewed and approved by the Navy and/or RASO prior to finalization. In addition, a Contractor Quality Control Plan is included in Appendix D to the Work Plan. The Contractor Quality Control Plan describes the quality control actions and procedures that will be followed during execution of work under this contract task order. Work instructions developed for the basewide radiological support program will be inserted into Appendix E of this Work Plan and maintained on site. Work instructions that are no longer applicable will be removed from Appendix E of this Work Plan.

3.0 References

Aptim Federal Services, LLC (APTIM), 2017a, *Radiation Prevention Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California*.

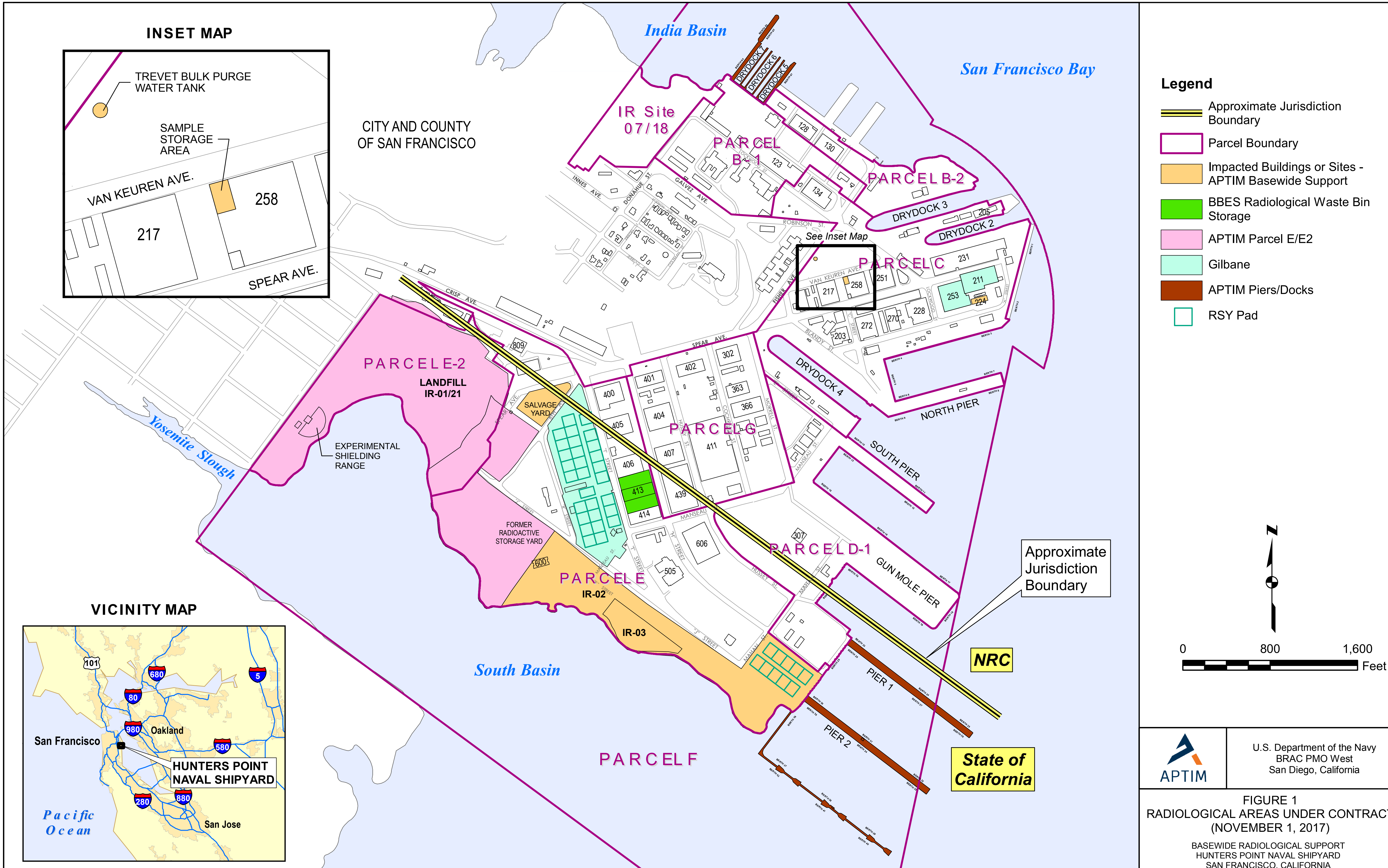
APTIM, 2017b, *Accident Prevention Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California*.

APTIM, 2017c, *APTIM Management System*.

Code of Federal Regulations, Title 10, Section 19, *Notices, Instructions and Reports to Workers: Inspection and Investigations*, current version.

Code of Federal Regulations Title 10, Section 20, *Standards for Protection Against Radiation*, current version.

Figures



U.S. Department of the Navy
BRAC PMO West
San Diego, California

FIGURE 1
RADIOLOGICAL AREAS UNDER CONTRACT
(NOVEMBER 1, 2017)

BASEWIDE RADIOLOGICAL SUPPORT
HUNTERS POINT NAVAL SHIPYARD
SAN FRANCISCO, CALIFORNIA

G:\HUNTERS_PT\GIS_Documents\Project_Maps\Basewide\WorkPlan\HP_BW_001_RAD_areas.mxd 9/25/2017

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
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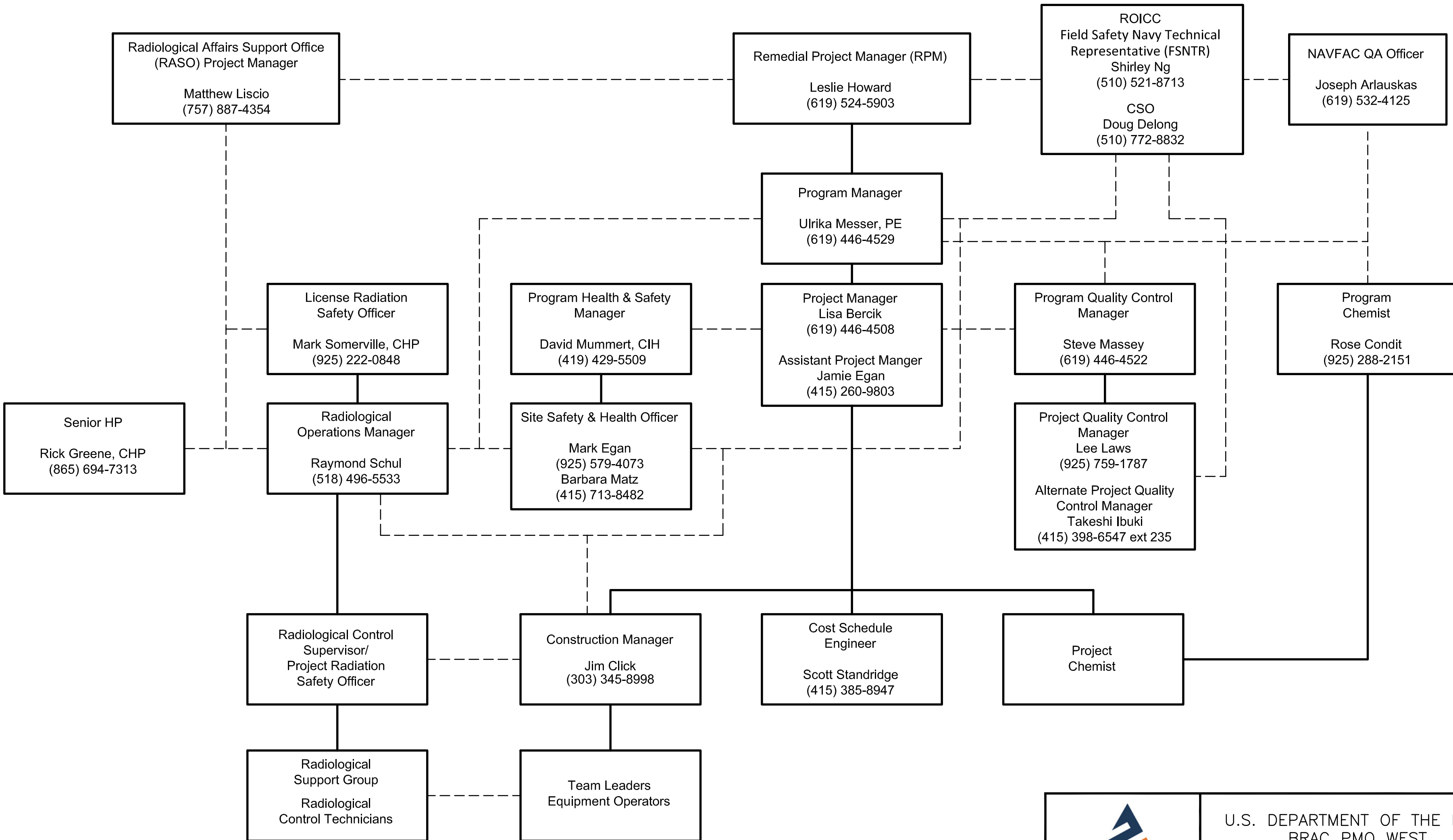


LEGEND

- - - - - LINES OF COMMUNICATION

——— LINES OF AUTHORITY

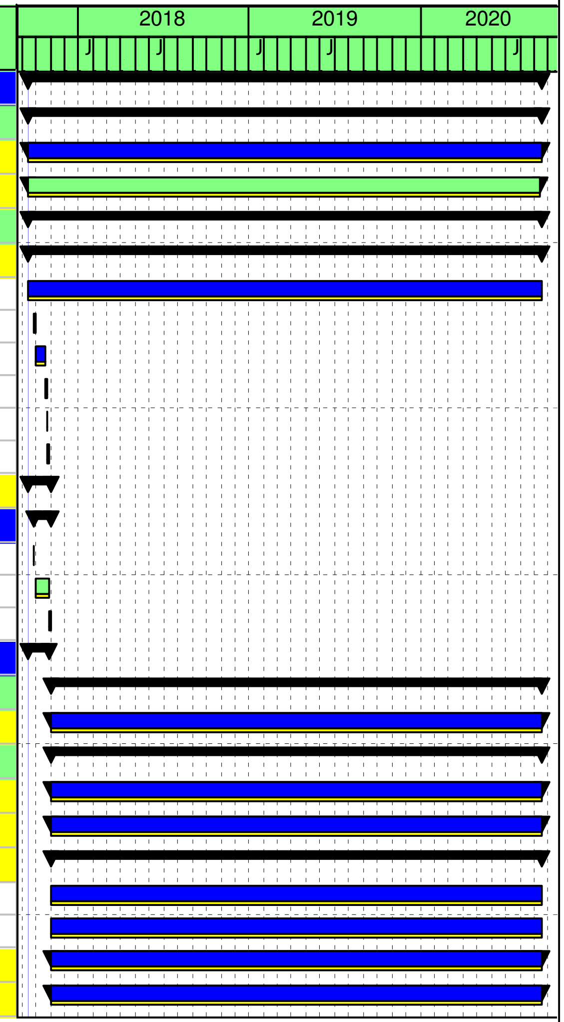
APTIM

U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

FIGURE 2
ORGANIZATION CHART

BASEWIDE RADIOLOGICAL SUPPORT
HUNTERS POINT NAVAL SHIPYARD
SAN FRANCISCO, CALIFORNIA

Activity Name	Original Duration	Start	Finish
DO 4550 Radiological Work Tasks at Parcels C, D-1, and F, Hunters Point Naval Shipya	757	15-Sep-17	15-Sep-20
Work Element 1- Project Management Support	757	15-Sep-17	15-Sep-20
Project Mgmt - Project Management & Administrative Support	757	15-Sep-17	15-Sep-20
Memorandum of Understanding	756	15-Sep-17	14-Sep-20
Work Element 3 - Planning Documents	757	15-Sep-17	15-Sep-20
Basewide Radiological Support Work and Abbrev. SAP and Work Instructions	757	15-Sep-17	15-Sep-20
Work Instructions (6 total)	757	15-Sep-17	15-Sep-20
Internal Draft Work Plan	4	26-Sep-17	29-Sep-17
Navy Review of Internal Draft Work Plan (21 Calendar Days)	15	02-Oct-17	20-Oct-17
Respond to Navy Comments on the Internal Draft Work Plan	2	23-Oct-17	24-Oct-17
Navy Review and Comment	1	25-Oct-17	25-Oct-17
Issue Final Work Plan	3	26-Oct-17	30-Oct-17
Supporting Planning Documents	34	15-Sep-17	01-Nov-17
Health and Safety Plan (including Site Safety and Health Plan and Accident I	27	26-Sep-17	01-Nov-17
Internal Draft Final HSP/APP	3	26-Sep-17	28-Sep-17
Navy Review of Internal Draft Final HSP/APP	22	29-Sep-17	30-Oct-17
Respond to Navy Comments and Issue Final	2	31-Oct-17	01-Nov-17
Contractor Quality Control (CQC) Plan	32	15-Sep-17	30-Oct-17
Work Element 4 - Field Work Activities	724	01-Nov-17	15-Sep-20
Portal Monitor and Truck Wash	724	01-Nov-17	15-Sep-20
Work Element 6 - Maintenance of Remedies	724	01-Nov-17	15-Sep-20
Maintenance of Radiological Controls, Postings, and Routine Surveys	724	01-Nov-17	15-Sep-20
Stockpile Tracking	724	01-Nov-17	15-Sep-20
Radiological Support to Other Contractors	724	01-Nov-17	15-Sep-20
Radiological Support to Other Contractors	724	01-Nov-17	15-Sep-20
Radiological Awareness Briefings and Incoming and Outgoing Surveys	724	01-Nov-17	15-Sep-20
Radioactive Check Sources	724	01-Nov-17	15-Sep-20
Personal Dosimetery	724	01-Nov-17	15-Sep-20



Project Baseline Bar
Actual Work
Remaining Work
Critical Remaining Work
Mile...
Su...

Project Schedule - Delivery Order: N6247317F4550
Basewide Radiological Support,
Hunters Point Naval Shipyard, San Francisco, CA

Figure 3
Project Schedule

APTIM

Appendix A
Waste Management Plan

Naval Facilities Engineering Command Southwest
San Diego, CA

Appendix A
Final
Waste Management Plan

Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

October 2017

APTM-0006-4550-0008

Naval Facilities Engineering Command Southwest
San Diego, CA

Appendix A
Final
Waste Management Plan

Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

October 2017

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Project Manager

October 23, 2017
Date

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Acronyms and Abbreviations

APTIM	Aptim Federal Services, LLC
LLMW	low-level mixed waste
LLRW	low-level radiological waste
PPE	personal protective equipment
Navy	U.S. Department of the Navy
NRC	U.S Nuclear Regulatory Commission
T&D	transportation and disposal

1.0 Introduction

This Waste Management Plan was prepared and will be implemented by Aptim Federal Services, LLC (APTIM), under Contract No. N62473-17-D-0006, Contract Task Order N62473-17-F-4550. This document is submitted as Appendix A of the Work Plan.

This Waste Management Plan describes the categories of waste and project management and engineering controls that APTIM will use to accumulate, transport, and dispose of waste generated at the site in a cost-effective, timely, and compliant manner. Section 2.0 includes a summary of the types of waste expected to be generated when providing radiological support to contractor performing work in radiologically impacted areas. It also provides specific waste information and the Transportation and Disposal (T&D) Coordinator's associated responsibilities for each T&D activity.

2.0 Waste Categories and Classification

This section describes the types of waste anticipated to be generated during the Basewide Radiological Support project.

The Site Superintendent will ensure waste from different sources are additionally segregated by each individual source. The T&D Coordinator will then review available information and determine whether the waste from different sources can be commingled for both cost and handling efficiency. Table 1 includes information regarding waste accumulation methods and times.

2.1 Solid Waste

Site activities will consist of radiological support of non-radiological contractors in radiologically controlled or restricted areas, operation of the site portal monitor, and routine radiological compliance and controls activities. Waste generated during these activities will either be radiological or non-radiological in nature (Table 2 and Table 3). Practical measures will be implemented to minimize the generation of low-level radiological waste (LLRW; materials that contain radionuclides at greater than Hunters Point Action Levels) or low-level mixed waste (LLMW; waste containing both LLRW and levels of chemicals triggering a hazardous waste designation).

LLRW or LLMW that are anticipated may include, but are not limited to, the following:

- Soil
- Construction debris
- Personal protective equipment (PPE)

Non-radiological waste that are anticipated may include, but are not limited to, the following:

- Soil
- Construction debris
- Vegetation/green waste
- Refuse and debris (i.e., used sampling equipment)
- PPE

2.2 Liquid Waste

Waste liquids may be generated from decontamination water generated from equipment and personnel decontamination.

If liquid waste is generated, it will be stored in drums or tanks, or equivalent and appropriately labeled. When the drums or tanks are full or after 60 days, whichever comes first, the water will be sampled to determine if it meets sewer discharge requirements; if not, water analyses will serve as waste profiling per off-site disposal requirements.

3.0 Transportation and Disposal Activities

The following subsections address specific control and management practices for LLRW and LLMW. Waste characterization activities will include radiological screening of waste debris and other materials prior to final disposition. Surveys will follow APTIM's U.S. Nuclear Regulatory Commission (NRC) and/or California license procedures for free release (Appendix A). If classified as LLRW or LLMW, these waste may be placed in containers provided by the U.S. Department of the Navy (Navy) LLRW waste broker. The Navy's LLRW waste broker will coordinate closely with the Navy's Radiological Affairs Support Office and be responsible for packaging, shipping, manifesting, and disposal of LLRW and LLMW.

3.1 Waste Classification

Radioactive waste will be classified as either LLRW or LLMW per NRC guidelines and/or disposal facility requirements. Waste characteristics, including the radionuclides present and their associated specific activity, will be measured using available standardized test methods such as those listed in Table 2.

3.2 Waste Accumulation and Storage

Radiologically impacted soil and/or debris will be placed in covered and lined roll-off containers (or other suitable container) which will be provided by the Navy's LLRW waste broker. The Navy's LLRW waste broker will assign a unique identification number to each individual container and will supervise and manage the tracking and contents of each bin.

Wastewater from the radioactive material decontamination area will be maintained separately from hazardous decontamination and dewatering wastewater. The wastewater will be managed as LLRW wastewater until the chemical and radiological characteristics are known.

Attachment 1 provides the "Waste Inventory Log" that the Project Site Superintendent will use to track project waste. Attachment 2 provides the "Waste Storage Area Inspection Checklist" that the Project Site Superintendent will use to inspect each waste storage area on a weekly basis.

3.3 Labeling and Posting of Containers Containing Radioactive Waste

Each waste container containing LLRW will be labeled and placed in a designated radioactive material storage area. The waste container will be labeled with a "Caution—Radioactive Material" label. The label will also note the maximum surface radiation level (measured in microroentgen per hour). The waste inventories will be managed under APTIM's NRC license until it is transferred to the Navy's LLRW waste broker.

3.4 Waste Accumulation Areas

APTIM will implement, at a minimum, the following requirements for radioactive waste stored on site within a designated radiologically impacted area:

- Display an industry standard placard and barrier materials with wording that includes the following, "Caution, Radiologically Controlled Area, Radioactive Materials Area, RWP Required for Entry, Authorized Personnel Only" (written in English and Spanish), at each radiological storage area every 50 feet (or 15 meters). The signs will be legible.
- Aisle space will be maintained to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency.

- The areas will be secured to prevent unauthorized access to the material.
- The following emergency equipment will be located or available to personnel during active waste management activities at each accumulation area:
- A device, such as a telephone or a hand-held two-way radio, capable of summoning emergency assistance will be available.
- Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment will be available.

Filled containers generated during performance of this Work Plan will be stored at the site where they were generated until the contained material can be characterized for packaging and disposal by the waste broker.

3.5 Waste Minimization

To minimize the volume of waste streams generated during the project, the following general guidelines will be followed:

- Waste material will not be cross-contaminated unnecessarily.
- Work will be planned ahead.
- Material may be stored in large containers, but the smallest reasonable container will be used to transport the material to the location where it is needed.
- Cleaning and extra sampling supplies will be maintained outside any potentially contaminated area to keep them clean and to minimize additional waste generation.
- Mixing of detergents or decontamination solutions will be performed outside potentially contaminated areas.
- When decontaminating radioactively contaminated material, every effort should be made to minimize the generation of mixed waste.
- Drop cloths or other absorbent material will be used to contain small spills or leaks.
- Contaminated material will not be placed with clean material.
- Wooden pallets inside the exclusion zone will be covered with plastic.
- Material and equipment will be decontaminated and reused when practical.
- Volume reduction techniques will be used when practicable.
- Waste containers will be verified to ensure that they are solidly packed to minimize the number of containers.

3.6 Inspections

While waste accumulation areas will be informally inspected on a daily basis, formal inspections of radiological controlled areas under APTIM NRC license will be inspected weekly. The Project Radiation Safety Officer or designee will conduct inspections. Inspections will be logged in a dedicated field notebook, and a weekly inspection checklist will be completed. The radiologically controlled areas will be inspected to ensure the following:

- The containers will be checked for good condition. If a container is not in good condition, the waste broker will be informed.
- The containers will be checked to ensure that they remain closed and secured at all times, except when adding or removing waste.
- The soil stockpiles will be checked to see they are properly identified/labeled and that their identification number is legible.
- The fence lines and gates will be checked for signs of break-ins or vandalism.

3.7 Waste Disposal

Waste generated under this project, which will require off-site disposal by the Navy's basewide disposal contractors, include the following:

- Debris, PPE, and soil classified as unsuitable for reuse as backfill, based on radiological analysis, will be directly loaded into bins and transferred to the Navy's LLRW waste broker for disposal. Bins will be provided by the Navy's LLRW waste broker.
- Debris, PPE, and soil not classified as radiologically impacted will be moved outside the radiologically controlled area following approval from Radiological Affairs Support Office. The basewide T&D contractor will direct placement, characterization, and disposal of the releases debris, PPE, and/or soil.
- Wastewater will be characterized and profiled for appropriate off-site treatment and/or disposal.

4.0 References

California Code of Regulation, Title 22, Social Security, Division 4.5, "Environmental Health Standards for the Management of Hazardous Waste," Chapter 12, "Standards Applicable to Generators of Hazardous Waste," current.

Code of Federal Regulations, Title 40, Part 300, *National Oil and Hazardous Substances Pollution Contingency Plan*, U.S. Government Printing Office, Washington, D.C.

Tables

Table 1
Waste Accumulation Methods and Times

Waste	Accumulation Method	Maximum Accumulation Times
LLRW (from soil and building screening)	Temporary waste pile; roll-off container	Not applicable for nonhazardous; 90 days maximum for hazardous according to 22 CCR Section 66262.34
PPE and Visqueen®	Roll-off container; plastic bag	Not applicable for nonhazardous; 90 days maximum for hazardous according to 22 CCR Section 66262.34
Wastewater (from equipment decon activities and/or dewatering of excavations)	Temporary storage tank	Not applicable for nonhazardous; 90 days maximum for hazardous according to 22 CCR Section 66262.34

Notes:

California Code of Regulation (CCR), Title 22, Social Security; Division 4.5, Environmental Health Standards for the Management of Hazardous Waste; Chapter 12, Standards Applicable to Generators of Hazardous Waste; current through April 10, 2009.

LLRW — *low-level radiological waste*
PPE — *personal protective equipment*

Table 2
Waste Sample Types and Analyses

Waste	Sample Type	Analytical Methods
LLRW (from soil and debris screening)	Representative	Surface contamination and gamma scanning surveys Gamma spectroscopy for radium-226 and cesium-137 (EPA Method 901.1) Other radionuclide-specific analyses as required
PPE and Visqueen®	Not necessary since will infer from analytical data representing the soil	Will infer from analytical data representing the soil
Wastewater (from equipment decon activities and/or dewatering of excavations)	Representative	Radium-226/228 (EPA Methods 903/904) Other radionuclide-specific analyses as required

Notes:

California Code of Regulation (CCR), Title 22, Social Security; Division 4.5, Environmental Health Standards for the Management of Hazardous Waste; Chapter 12, Standards Applicable to Generators of Hazardous Waste; current through April 10, 2009.

EPA	*U.S. Environmental Protection Agency*
LLRW	*low-level radiological waste*
PPE	*personal protective equipment*

Table 3
Preliminary Characterization and Classification

Waste Stream	EPA/DTSC Characterization	DOT Classification
LLRW or LLMW (from soil and building screening)	Class A LLRW	Class 7 or not regulated
PPE and Visqueen®	Nonhazardous	Not applicable
Wastewater	Nonhazardous	Not applicable

Notes:

DOT	*U.S. Department of Transportation.*
DTSC	*California Department of Toxic Substances Control*
EPA	*U.S. Environmental Protection Agency*
LLMW	*low-level mixed waste*
LLRW	*low-level radiological waste*
PPE	*personal protective equipment*

Attachment 1
Waste Inventory Log

WASTE INVENTORY LOG

Aptim Federal Services LLC
N62473-15-D-0811 | CTO N6247317F4550
Hunters Point Naval Shipyard San Francisco,
California

Date of Inventory Inspection: ____________ Inspected by: ____________________________

Manifest Number	Container Number	Container Type	Container Volume	Generation Date	Waste Description/ Originating Site	Date Removed from site

Attachment 2
Waste Storage Area Inspection Checklist

Waste Storage Area Inspection Checklist

Inspected by: ___________________ Date: _______ Time: ______

	Yes	No	Corrective Action		Date Corrected
Area posted with appropriate hazard and cautionary signs	☐	☐	____________		____________
Area free of spills?	☐	☐	____________		____________
All liquids stored in proper secondary containment?	☐	☐	____________		____________
Secondary containment basins free of liquids, snow and debris?	☐	☐	____________		____________
Containers compatible with waste being stored?	☐	☐	____________		____________
Containers properly sealed (lids on, rings in place, bins covered, etc.)?	☐	☐	____________		____________
All containers properly labeled?	☐	☐	____________		____________
Labels easily visible for inspection?	☐	☐	____________		____________
Accumulation start dates present on labels?	☐	☐	____________		____________
Accumulation start dates with storage time limit (e.g., 90 days)?	☐	☐	____________		____________
Information on all labels legible not faded and all required information is present?	☐	☐	____________		____________
Adequate aisle space for drums (minimum 22 inches)?	☐	☐	____________		____________
Aisles and doorways free of obstructions?	☐	☐	____________		____________
Containers free of leaks, dents or deterioration including structural defects and rusting?	☐	☐	____________		____________
Adequate separation of incompatible materials?	☐	☐	____________		____________
Tops of containers free of standing water?	☐	☐	____________		____________
Stockpiles adequately covered?	☐	☐	____________		____________

Notes: ____

____

Appendix B
Abbreviated Sampling and Analysis Plan

SAP Worksheet #1: Title and Approval Page

Final
ABBREVIATED SAMPLING AND ANALYSIS PLAN
(Field Sampling Plan and Quality Assurance Project Plan)

October 2017

Radiological Work Tasks, Remedial Action, and Maintenance of Remedies
Task: Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

Prepared for:
Base Realignment and Closure
Program Management Office West
Naval Facilities Engineering Command Southwest
33000 Nixie Way, Building 50
San Diego, California 92147

Prepared by:
Aptim Federal Services, LLC
4005 Port Chicago Highway, Suite 200
Concord, California 94520-1120
925.288.9898

Prepared under:
Contract Number: N62473-17-D-0006
Contract Task Order: N62473-17-F-4550
Document Control Number: APTM-0006-4550-0008

Review Signatures: Stephen P. Massey October 23, 2017
Stephen Massey/Program QA Manager Date

EXECUTIVE SUMMARY

This abbreviated Sampling and Analysis Plan has been prepared by Aptim Federal Services, LLC (APTIM) to support sampling and analytical tasks associated with the radiological work tasks, remedial action, and maintenance of remedies at Hunters Point Naval Shipyard. Specifically, this Sampling and Analysis Plan addresses tasks associated with basewide radiological support. Project work includes the performing radiological support activities for non-radiological contractor (including soil and water sampling) and operation of the site portal monitor and truck wash.

Sampling activities will include radiological soil or water sampling in support of field activities performed by a non-radiological contractor. These activities will be performed in accordance with the project Work Plan, State of California Radioactive Materials License Number 7889-07 and U.S. Nuclear Regulatory Commission License 20-31340-01 issued to APTIM, and the *Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California* (APTIM; 2017a). No chemical sampling is anticipated for this portion of the work scope.

SAP Worksheets

SAP Worksheets (continued)

List of Figures

List of Attachments

List of Acronyms

<	less than
>	greater than
±	plus or minus
≤	less than or equal to
≥	greater than or equal to
°C	degree Celsius
^{90}Sr	strontium-90
^{137}Cs	cesium-137
^{226}Ra	radium-226
^{239}Pu	Plutonium-239
^{240}Pu	Plutonium-240
APTIM	Aptim Federal Services LLC
BSC	background subtraction count
CCV	continuing calibration verification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	chain-of-custody
DoD	U.S. Department of Defense
DLC	decision level concentration
DL	detection limit
DQA	data quality assessment
DQO	data quality objective
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
FWHM	full width at half maximum
H&S	health and safety
HPNS	Hunters Point Naval Shipyard
ICAL	initial calibration
ICV	initial calibration verification
ID	identification
keV	kiloelectron volt
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
MARLAP	*Multi-Agency Radiological Laboratory Analytical Protocols Manual*
MARSSIM	*Multi-Agency Radiation Survey and Site Investigation Manual*
MS	matrix spike
MSD	matrix spike duplicate
NAVFAC SW	Naval Facilities Engineering Command Southwest
Navy	U.S. Department of the Navy
NRC	U.S. Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration

List of Acronyms (continued)

pCi/G	picocurie per gram
PM	project manager
POC	point of contact
QA	quality assurance
QAO	Quality Assurance Officer
QC	quality control
QSM	*Quality Systems Manual for Environmental Laboratories, Version 5.1*
RASO	Radiological Affairs Support Office
RPD	relative percent difference
RPM	Remedial Project Manager
RPP	*Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California*
RSO	Radiation Safety Officer
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
SSHO	Site Safety and Health Officer
UFP-QAPP	*Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data*

SAP Worksheet #2: SAP Identifying Information

Site Name/Number:	**Basewide Radiological Support at Hunters Point Naval Shipyard (HPNS)**
Contractor Name:	**Aptim Federal Services, LLC (APTIM)**
Contract Number:	**N62473-17-D-0006**
Contract Title:	**EMAC III**
Work Assignment Number (optional):	**Contract Task Order N62473-17-F-4550**

1. This Sampling and Analysis Plan (SAP) was prepared in accordance with the *Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs* (UFP-QAPP; U.S. Environmental Protection Agency [EPA], 2005) and *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5*, Office of Environmental Information (EPA, 2001). With additional guidance from the following publications:

    - *Quality Systems Manual for Environmental Laboratories, Version 5.1* (QSM; U.S. Department of Defense [DoD], 2017)
    - *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA, 2006)
    - *Environmental Work Instruction 3EN2.1—Chemical Data Validation* (Naval Facilities Engineering Command Southwest [NAVFAC SW], 2001)
    - *Environmental Work Instruction EVR.2—Review, Approval, Revision, and Amendment of Sampling and Analysis Plans* (NAVFAC SW, 2011)
    - *Environmental Work Instruction EVR.4—Implementing and Maintaining the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Administrative Record and Compendium at NAVFAC Southwest* (NAVFAC SW, 2007)
    - Environmental Work Instruction EVR.6—Environmental Data Management and Required Electronic Delivery Standards (NAVFAC SW, 2005)

2. Identify regulatory program: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

3. This is a project-specific SAP and includes only specifics about radiological analyses.

4. List dates of scoping sessions that were held: September 25, 2017 (Project Kick-Off Meeting)

5. List dates and titles of any SAP documents written for previous site work that are relevant to the current investigation.

Title	Date
No relevant documents available	

6. List organizational partners (stakeholders) and connection with lead organization: Example for project-specific SAPs:

Oversight by the California Department of Toxic Substances Control
Oversight by the California Department of Public Health, Division of Drinking Water and Environmental Management
Oversight by the California Regional Water Quality Control Board

7. Lead organization

U.S. Department of the Navy (Navy)
Oversight by the Radiological Affairs Support Office (RASO)

8. If any required SAP elements or required information are not applicable to the project or are provided elsewhere, then note the omitted SAP elements and provide an explanation for their exclusion below:

This is a SAP for basewide radiological support services and does not require regulatory or Navy Quality Assurance Officer (QAO) review. The following worksheet is not applicable and has been omitted: 24

UFP-QAPP Worksheet #	Required Information	Crosswalk to Related Information
A. Project Management		
Documentation		
1	Title and Approval Page	
2	Table of Contents; SAP Identifying Information	
3	Distribution List	
4	Project Personnel Sign-Off Sheet	
Project Organization		
5	Project Organizational Chart	
6	Communication Pathways	
7	Personnel Responsibilities and Qualifications Table	
8	Special Personnel Training Requirements Table	
Project Planning/Problem Definition		
9	Project Planning Session Documentation (Including Data Needs Tables); Project Scoping Session Participants Sheet	
10	Problem Definition, Site History, and Background Site Maps (Historical and Present)	
11	Site-Specific Project Quality Objectives	
12	Measurement Performance Criteria Table	
13	Sources of Secondary Data and Information Secondary Data Criteria and Limitations Table	
14	Summary of Project Tasks	
15	Reference Limits and Evaluation Table	
16	Project Schedule/Timeline Table	
B. Measurement Data Acquisition		
Sampling Tasks		
17	Sampling Design and Rationale	
18	Sampling Locations and Methods/Standard Operating Procedure (SOP) Requirements Table Sample Location Map(s)	
19	Analytical Methods/SOP Requirements Table	
20	Field Quality Control (QC) Sample Summary Table	
21	Project Sampling SOP References Table Sampling SOPs	
22	Field Equipment Calibration, Maintenance, Testing, and Inspection Table	

UFP-QAPP Worksheet #	Required Information	Crosswalk to Related Information
Analytical Tasks		
23	Analytical SOPs Analytical SOP References Table	
24	Analytical Instrument Calibration Table	
25	Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table	
Sample Collection		
26	Sample Handling System, Documentation Collection, Tracking, Archiving and Disposal Sample Handling Flow Diagram	
27	Sample Custody Requirements, Procedures/SOPs Sample Container Identification Example Chain of Custody (COC) Form and Seal	
QC Samples		
28	QC Samples Table Screening/Confirmatory Analysis Decision Tree	
Data Management Tasks		
29	Project Documents and Records Table	
30	Analytical Services Table Analytical and Data Management SOPs	
C. Assessment Oversight		
31	Planned Project Assessments Table Audit Checklists	
32	Assessment Findings and Corrective Action Responses Table	
33	Quality Assurance (QA) Management Reports Table	
D. Data Review		
34	Verification (Step I) Process Table	
35	Validation (Steps IIa and IIb) Process Table	
36	Validation (Steps IIa and IIb) Summary Table	
37	Usability Assessment	

Notes:

Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs (EPA, 2005)

SAP Worksheet #3: Distribution List

Name of SAP Recipients	Title/Role	Organization	Telephone Number	Email Address or Mailing Address
Leslie Howard	Remedial Project Manager (RPM)	NAVFAC SW	619.524.5903 (office)	leslie.howard.ctr@navy.mil Base Realignment and Closure Program Management Office West 33000 Nixie Way, Bldg 50 San Diego, California 92147
Matthew Liscio	Environmental Protection Manager	RASO; Naval Sea System Command Detachment	757.887.4354 (office)	matthew.liscio@navy.mil Building 1959 NWS P.O. Drawer 260 Yorktown, Virginia 23691-0260
Ulrika Messer	Program Manager	APTIM	619.446.4529 (office)	ulrika.messer@aptim.com 1230 Columbia Street, Suite 600 San Diego, California 92101
Lisa Bercik	Project Manager (PM)	APTIM	619.446.4508 (office)	lisa.bercik@aptim.com 1230 Columbia Street, Suite 600 San Diego, California 92101
Jamie Egan	Assistant PM	APTIM	415.636.4036 (office)	jamie.egan@aptim.com 315 Montgomery Street, Suite 900 San Francisco, California 94104
Rose Condit	Program Chemist	APTIM	925.288.2151 (office)	rose.condit@aptim.com 4005 Port Chicago Highway Concord, California 94520
Steve Massey	Program QC Manager	APTIM	619.446.4522 (office)	stephen.massey@aptim.com 1230 Columbia Street, Suite 600 San Diego, California 92101
Raymond Schul	Radiological Operations Manager	APTIM	518.496.5533 (mobile)	raymond.schul@aptim.com 4038 Masonboro Loop Road Wilmington, North Carolina 28409

SAP Worksheet #3: Distribution List (continued)

Name of SAP Recipients	Title/Role	Organization	Telephone Number	Email Address or Mailing Address
Randall Killpack	Project Radiation Safety Officer (RSO)/License Authorized User	APTIM	801.244.2394 (mobile)	randall.killpack@atpim.com 200 Fischer Avenue Former Hunters Point Naval Shipyard San Francisco, California 94124
Minh Chi	Project RSO Representative	APTIM	415.741.8299 (mobile)	minhsec.chi@aptim.com 200 Fischer Avenue Former Hunters Point Naval Shipyard San Francisco, California 94124
Lee Laws	Project QC Manager	APTIM	925.759.1787 (mobile)	lee.laws@aptim.com 950 Avenue M, Building 570 San Francisco, California 94130
Barbara Matz	Alternate QC Manager	APTIM	415.713.8482 (mobile)	barbara.matz@aptim.com 4005 Port Chicago Highway Concord, California 94520
Erika Gish	Laboratory PM	Test America, St. Louis Laboratory	925.513.1270 314.298.8566	erika.gish @testamericainc.com 13715 Rider Trail North Earth City, Missouri 63045

SAP Worksheet #4: Project Personnel Sign-Off Sheet

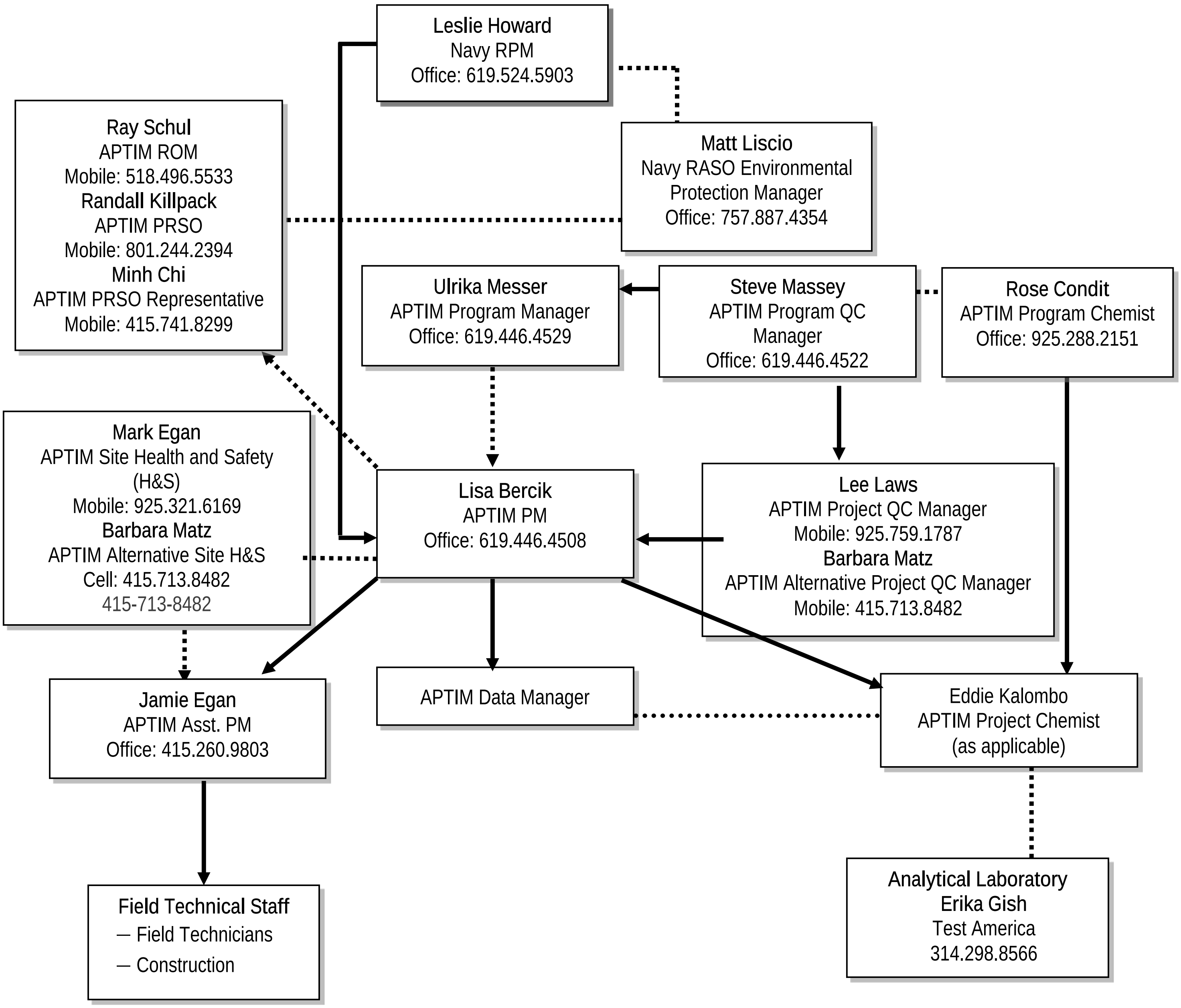
Name	Organization/Title/Role	Signature/Email Receipt	SAP Section Reviewed	Date SAP Read
Lisa Bercik	APTIM PM			
Eddie Kalombo	APTIM Project Chemist			
Lee Laws	APTIM Project QC Manager			
Barbara Matz	APTIM Alternate Project QC Manager			
Erika Gish	Test America PM			

Note:

The signed SAP Worksheet #4 will be stored in the on-site project files, and then will be transferred to the APTIM Concord, California home office file storage at completion of fieldwork.

SAP Worksheet #5: Project Organization Chart

All lines of responsibility (solid lines) and lines of communication (dotted lines) are provided.



SAP Worksheet #6: Communication Pathways

Communication Drivers	Responsible Affiliation	Name	Telephone Number and/or Email	Procedure
Point of Contact (POC) with the Navy RPM and RASO	PM Asst. PM	Lisa Bercik Jamie Egan	619.446.4508 415.636.4036	All materials and information about the project will be forwarded to the RPM by the PM or Asst. PM.
SAP Changes in the Field	Project Chemist or Program Chemist	Rose Condit Eddie Kalombo	925.288.2151 415.987.0760	The Project Chemist is responsible for documenting field changes related to sampling. The Project Chemist or Program Chemist is also responsible for generating SAP amendments as necessary for approval by the Navy QAO. The Project Chemist oversees the documentation, notification, and corrective actions associated with project management issues in writing. Due to the potential impact field changes and SAP amendments may have on the project, the Project Chemist is to be notified of such issues within 24 hours.
Sampling Quality Issues	Project or Program QC Manager Project or Program Chemist	Lee Laws, Barbara Matz, or, Steve Massey Eddie Kalombo or Rose Condit	925.759.1787 415.713.8482 619.446.4522 415.987.0760 925.288.2151	In general, the Project Chemist is the POC for sampling and chemistry issues and the Project QC Manager is the POC for other quality issues. If quality issues are not resolved at the project level (in consultation with the PM, Project Site Superintendent, Technical Lead, etc.), then the issue will be elevated to the Program Chemist or Program QC Manager). The Program Chemist or designee will seek additional guidance or approval from the Navy QAO, if necessary. Upon resolution, the Project QC Manager or Project Chemist oversees the documentation, notification, and corrective actions associated with the QA issues in writing.

SAP Worksheet #6: Communication Pathways (continued)

Communication Drivers	Responsible Affiliation	Name	Telephone Number and/or Email	Procedure
Sample Collection Issues	Project Chemist or Program Chemist	Eddie Kalombo or Rose Condit	415.987.0760 925.288.2151	The Project Chemist is the POC for sampling and chemistry issues. If sampling issues are not resolved at the project level (in consultation with the PM and other staff), then the issue will be elevated to the Program Chemist (Rose Condit) or Program QC Manager. The Program Chemist or Program QC Manager will seek additional guidance or approval from the Navy QAO, if necessary. Upon resolution, the Project Chemist oversees the documentation, notification, and corrective actions associated with the QA issues in writing. Due to the potential impact, sampling issues may have on the project the Project Chemist is to be notified of sampling issues within 24 hours.
Laboratory Reporting or Data Quality Issues	Program Chemist/ Data Manager	Rose Condit	925.288.2151	The Project Chemist is the POC for laboratory issues. The project Data Manager is the POC for electronic data deliverables (EDD). If laboratory issues are not resolved with the Project Chemist or Data Manager, then the issue will be elevated to the Program Chemist. If significant problems are identified from the laboratory that will impact the usability of the data, the Project Chemist should inform the PM, Navy RPM, and other parties as applicable within 24 hours of discovery or by the next business day. Upon resolution, the Project Chemist oversees the documentation, notification, and corrective actions associated with the laboratory issue in writing.

SAP Worksheet #6: Communication Pathways (continued)

Communication Drivers	Responsible Affiliation	Name	Telephone Number and/or Email	Procedure
Notification of Non-Usable Analytical Data	Program Chemist	Rose Condit	925.288.2151	If significant problems are identified by the laboratory or the project team that impact the usability of the data (i.e., the data is rejected or the data quality objectives are not met), the Program Chemist will notify the NAVFAC SW RPM and the NAVFAC SW QAO within 24 hours or the next business day.
Field Activity Issues	PM Assistant PM	Lisa Bercik Jamie Egan	619.446.4508 415.260.9803	The PM is the POC for all project site activities such as scheduling, staffing, subcontractors, fieldwork, etc. The Assistant PM, in consultation with the PM and Navy RPM, if necessary, will resolve project site issues. Upon resolution, the PM or Assistant PM oversees the documentation, notification, and corrective actions associated with site issues in writing. The PM or Assistant PM is to be notified of site issues within 24 hours.
Health and Safety (H&S) Issues	Site Safety and Health Officer (SSHO)	Mark Egan or Barbara Matz	925.321.6169 415.713.8482	The Project SSHO is the POC for H&S issues. If H&S issues are not resolved at the project level (in consultation with the PM, Project Site Superintendent, Technical Lead, etc.), then the issue will be elevated to the Program SSHO. The Program SSHO or designee will seek additional guidance or approval from the Navy SSHO, if necessary. Upon resolution, the Project SSHO oversees the documentation, notification, and corrective actions associated with the issue in writing. Due to the potential seriousness of H&S issues, the SSHO is to be notified of H&S issues immediately.

SAP Worksheet #6: Communication Pathways (continued)

Communication Drivers	Responsible Affiliation	Name	Telephone Number and/or Email	Procedure
Stop Work Issues (H&S)	SSHO APTIM Employees	Mark Egan or Barbara Matz	925.321.6169 415.713.8482	All employees have the right and duty to stop work when conditions are unsafe, or when established safety procedures are being disregarded. Whenever an employee determines that workplace conditions present an immediate uncontrolled risk of injury or illness, immediate resolution with the appropriate supervisor shall be sought. Should the supervisor be unable or unwilling to correct the unsafe conditions, the employee is authorized and required to issue a Stop Work Order in accordance with APTIM Procedure CMS-710-05-PR-00400, “Stop Work Authority” (2017b). The specific activity or operation in question shall be discontinued until the issue is resolved.

SAP Worksheet #7: Personnel Responsibilities and Qualifications Table

Name	Title/Role	Organizational Affiliation	Responsibility
Leslie Howard	Navy RPM	Navy	• Manages governmental oversight of the project. • Manages project funding and scope. • Coordinates project documents review. • Primary contact and liaison with regulatory agencies. • Responsible for technical oversight of the project.
Lisa Bercik	PM	APTIM	• Manages oversight of the project for APTIM. • POC for communication with the Navy RPM and Navy contracts. • Ensures that all requirements of project contract are attained in a manner consistent with project plans. • Oversees planning, execution, and conclusion of all project activities. • Manages project budgets and schedules. • Develops work plans to address project scope of work. • Prepares work plan variances, if necessary. • Manages technical project elements.
Jamie Egan	Assistant PM	APTIM	• Performs activities as delegated by the PM, including coordination of field activities
Rose Condit	Program Chemist	APTIM	• Reviews and approves this SAP; Guides the selection of subcontract analytical laboratories. • Conducts field and laboratory audits; Serves as a POC for the Navy QAO. • Develops corrective action as required; Serves as a technical advisor to the project.

SAP Worksheet #7: Personnel Responsibilities and Qualifications Table (continued)

Name	Title/Role	Organizational Affiliation	Responsibility
Eddie Kalombo	Project Chemist	APTIM	• Develops the project data quality objectives (DQO) and prepares this SAP. • Selects qualified subcontract laboratories. • Implements chemical data QC procedures and audits field performance. • Reviews laboratory data prior to use. • Oversees third-party validation of laboratory data. • Reviews data validation report. • Prepares the appropriate sections of the report summarizing the project sampling activities.
Randall Killpack	Project RSO	APTIM	• Oversees overall radiological operations and documentation for the project. • Acts as the Technical Lead for radiological data collection. • Ensures that the Project Radiological Control Technicians have adequate training in sample collection. • Receives and reviews QA laboratory sample data to ensure DQOs are met.
Lee Laws Barbara Matz	Project QC Manager Alternate Project QC Manager	APTIM	• Develops the project QC objectives and prepares the QC Plan. • Administers the QC Plan. • Manages QC documentation and QC deliverables. • Lists definable features of work. • Conducts inspections (preparatory, initial, follow-up, completions).
Mark Egan Barbara Matz	SSHO Alternate SSHO	APTIM	• Develops and administers the Site Safety and Health Plan. • Manages personnel and environmental monitoring. • Coordinates preparation of job safety analyses. • Selects appropriate personal protective equipment and facilitates daily safety meetings. • Reviews essential H&S requirements with on-site personnel.

SAP Worksheet #7: Personnel Responsibilities and Qualifications Table (continued)

Name	Title/Role	Organizational Affiliation	Responsibility
APTIM Field Technician	Field Technician (sampling)	APTIM	• Performs all sampling in accordance with approved SAP. • Ensures that field QC samples are collected as specified in the SAP. • Completes field documentation and implements field corrective actions as required. • Must have Occupational Safety and Health Administration (OSHA) 40-hour Certification and 8-hour OSHA Refresher Certification as appropriate.
Erica Gish	Laboratory PM	Test America	• Oversees proper analysis and reporting of project samples according to approved SAP. • Manages communication between laboratory and APTIM Project Chemist. • Ensures proper QA/QC procedures are followed during laboratory analysis.

SAP Worksheet #8: Special Personnel Training Requirements Table

All field personnel will be required to have completed the OSHA 40-hour Hazardous Waste Operations and Emergency Response Standard Protection training, continued 8-hour Hazardous Waste Operations and Emergency Response, and submit to annual medical surveillance, as required by OSHA. The APTIM SSHO will be responsible for ensuring that training and/or certification is met and that qualified personnel are performing the work.

Project Function	Specialized Training—Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/Organizational Affiliation	Location of Training Records and Certificates
All On-Site Project Personnel	Title 49 Transportation Subpart H Function-specific Training	Radiological Controls Supervisor	Prior to start of fieldwork	All On-Site Project Personnel	Radiological Controls Supervisor	APTIM Project Files
	Radiation Worker Training (see *Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California* [RPP]; APTIM, 2017a)	APTIM Project RSO or designee	Prior to start of fieldwork	All On-Site Project Personnel	APTIM SSHO	APTIM Project Files
Radiological Monitoring Personnel	Site-Specific Qualification	Radiological Controls Supervisor	Prior to start of fieldwork	Junior and Senior Radiological Controls Technicians	Radiological Controls Supervisor	APTIM Project Files

SAP Worksheet #9: Project Scoping Session Participants Sheet

Project Name: Radiological Work Tasks, Remedial Action and Maintenance of Remedies
Task: Basewide Radiological Support at Hunters Point Naval Shipyard

Projected Date(s) of Sampling: 2017–2020

PM: Lisa Bercik | Site Location: Hunters Point Naval Shipyard, San Francisco CA

Date of Session: September 25, 2017

Scoping Session Purpose: Project kick-off meeting

Name	Title	Affiliation	Phone #	Email Address	Project Role
Leslie Howard	RPM	Navy	619.524.5903	leslie.howard.ctr@navy.mil	RPM
Danielle Janda	Lead RPM	Navy	619-524-6041	danielle.janda@navy.mil	Lead RPM
Veronica Gonzales	RPM	Navy	619-524-5755	veronica.gonzales@navy.mil	RPM
Doug Delong	Caretaker Site Office	Navy	415.743.4713	douglas.delong.ctr@navy.mil	Caretaker Site Office
Shirley Ng	Resident Officer in Charge of Construction	Navy	510.521.8713	shirley.ng@navy.mil	Resident Officer in Charge of Construction
Lisa Bercik	PM	APTIM	619.446.4508	lisa.bercik@aptim.com	Project Manager
Jim Click	Construction Manager	APTIM	303.345.8998	james.click@aptim.com	Construction Manager
Mike Ayala	Site Lead	APTIM	925.408.7121	mike.ayala@aptim.com	Site Lead
Mark Egan	SSHO	APTIM	925.579.4073	mark.egan@aptim.com	SSHO
Randall Killpack	Project RSO	APTIM	415.671.2969	randall.killpack@aptim.com	Project RSO
Barbara Matz	Alternate SSHO/Alternate Project QC Manager	APTIM	415.713.8482	barbara.matz@aptim.com	SSHO
Ray Schul	Program RSO	APTIM	518.496.5533	raymond.schul@aptim.com	Program RSO
Jim Langsted	Certified Health Physicist	APTIM	303.486.2513	Jim.langsted@aptim.com	Certified Health Physicist
Jamie Egan	PM	APTIM	415.260.9803	jamie.egan@aptim.com	Assistant Project Manager
Mark Vennemeyer	Project QC Manager	APTIM	925.579.4073	mark.vennemeyer@aptim.com	Project QC Manager

SAP Worksheet #9: Project Scoping Session Participants Sheet (continued)

Comments/Decisions:	Project kick-off meeting
Action Items/ Decisions:	None

SAP Worksheet #10: Problem Definition

The project scope includes providing radiological support to HPNS contractors performing non-radiological work in radiologically impacted areas.

10.1 SITE HISTORY AND DESCRIPTION

The *Final Historical Radiological Assessment, History and the Use of General Radioactive Materials, 1939-2003, Hunters Point Shipyard* (Navy, 2004) provides information on the historical use of radioactive materials at HPNS.

SAP Worksheet #11: Project Quality Objectives/Systematic Planning Process Statements

Step 1	Define the Problem that Necessitates the Study

Radiologically screen and sample soil, water, debris, and/or stockpiles as applicable under the project scope of work.

Step 2	Identify the Goal of the Study

The goals of the sampling activities are as follows:

- Collect radiological soil concentration data
- Where soil screening criteria are exceeded, collect sufficient data to delineate elevated areas and/or demonstrate successful removal of elevated soil

The study question is as follows:

- Do the sampling results support a conclusion that concentrations of project radionuclides of concern meet HPNS criteria for radiological release?

Step 3	Identify Information Inputs

The radiological surveys will include the following:

- Gamma scan data and gamma measurements at (biased) locations identified from scan data analysis
- Biased soil samples located to characterize the highest gamma scan results

Soil samples will be analyzed primarily by gamma spectroscopy (EPA Method 901.1 or equivalent) for cesium-137 (^{137}Cs), radium-226 (^{226}Ra) and daughters, and other gamma emitting radionuclides. Other radionuclide-specific analyses will be performed as noted in subsequent worksheets.

Step 4	Define the Boundaries of the Study

The area to be surveyed includes throughout HPNS when supporting other non-radiological contractors.

Step 5	*Develop the Analytic Approach*

Decision rules are described as follows:

Radiological soil sampling will be performed as specified in the Work Plan. The sampling frequency is designed to provide a high degree of confidence that the project areas are adequately characterized.

- If the results of the survey meet HPNS criteria for radiological release, then the data will be used to support a conclusion that the screened material meets the conditions for unrestricted radiological release.
- If the results of the survey exceed HPNS criteria, then remediation will be performed, and additional biased samples will be collected to verify that as-left soil conditions meet HPNS criteria.

SAP Worksheet #11: Project Quality Objectives/Systematic Planning Process Statements (continued)

Step 6	*Specify Performance or Acceptance Criteria*

To limit uncertainty in the obtained environmental data, criteria for the precision, accuracy, representativeness, completeness, and comparability parameters and limit of detection (LOD) for the contaminants of concern have been developed. Measurement errors will be controlled by using appropriate sampling and analytical methods, and the laboratory errors will controlled by adhering to the DoD QSM (2017), following established SOPs, and having the Project Chemist performing data review to verify laboratory processes. The field crews will review the SAP before sample collection to limit sample collection errors. The subcontract analytical laboratory will have a copy of this SAP and will adhere to DoD QSM (2017) guidance to limit measurement errors.

The *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (U.S. Nuclear Regulatory Commission [NRC] et al., 2000) guidelines will be used and a 95 percent confidence level for detecting radioactivity above the release criterion will be assumed with Type I and II errors limited to 2.5 and 5 percent, respectively.

Step 7	*Plan the Design for Obtaining Data*

The radiological survey design for this project is based on MARSSIM guidelines (NRC et al., 2000). Specific details regarding types of radiation measurements, instrument detection capabilities, quantities and locations of data to be collected and investigation levels are discussed in the Work Plan.

SAP Worksheet #12: Measurement Performance Criteria Table—Field Quality Control Samples (Soil—Backfill Material Only)

QC Sample	Analytical Group	Frequency	Data Quality Indicators	Measurement Performance Criteria	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Matrix Spikes (MS)	Not applicable				
Rinse Blanks	Not applicable				
Field Duplicates	None	Due to known heterogeneity of contaminant distribution in soil matrix, field duplicates for soil will not be collected for this project	Not Applicable	Not Applicable	S&A
Temperature Blanks	Radiochemical Analysis	Every cooler shipped to the laboratory	Representative-ness	0 – 6 degrees Celsius (°C)	S

SAP Worksheet #13: Secondary Data Criteria and Limitations Table

Secondary Data	Data Source (Originating Organization, Report Title and Date)	Data Generator(s) (Originating Organization, Data Types, Data Generation/Collection Dates)	How Data Will Be Used	Limitations on Data Use
Existing site radiological data	*Final Historical Radiological Assessment, History and the Use of General Radioactive Materials, 1939-2003, Hunters Point Shipyard*	Navy, 2004	Site characterization	None

SAP Worksheet #14: Summary of Project Tasks

14.1 SCOPE OF WORK

The scope of work of sampling activities for this project includes the following:

- Maintaining HPNS radiological controls and postings
- Performance of radiological surveys and sampling and providing radiological support to other contractors
- Performance of incoming and outgoing radiological surveys as needed
- Operation of the HPNS portal monitor
- Provide dosimetry to non-radiological contractor personnel

14.2 SAMPLE COLLECTION METHODS AND PROCEDURES

The following subsections describe the sampling methods and procedures that will be used to collect samples for this project.

14.2.1 Soil Sampling

Soil samples will be collected using a grab sampling technique. Samples will be collected using the following procedure:

1. Obtain a new (unused) disposable sampling scoop (or other nondisposable decontaminated sampling equipment).
2. Put on a new (unused) pair of sampling gloves and other appropriate personal protective equipment.
3. Collect the soil samples for radiological analysis into the appropriate sample containers using a disposable sampling scoop.
4. Submit soil samples for gamma spectroscopy analysis.
5. Label, package, and prepare the samples for shipment to the laboratory.
6. Radiologically release sample containers from the radiological areas prior to shipment to the laboratory.

14.2.2 Wastewater Sampling

Wastewater samples from on-site storage tanks, if needed, will be collected using a grab sampling technique (disposable bailer, Coliwasa, or equivalent). Samples will be collected using the following procedure:

1. Obtain an unused sampler for each sample event.
2. Put on a new, clean, and chemical-resistant pair of disposable gloves.

3. Lower the sampler into the containment area to the desired depth. Allow sufficient time for the bailer to fill with water.
4. Retrieve the sampler and fill appropriate bottle(s) for analyses being requested.
5. If the storage container is equipped with sampling taps, samples may be collected at these locations.
6. Cap the bottle(s) and wipe any moisture from the outside of the bottle(s).
7. Label, package, and prepare the samples for shipment to the laboratory. Transfer the samples to cold storage after collection.

14.2.3 Equipment Decontamination

Sampling equipment decontamination is not anticipated for this project since disposable equipment will be used as much as possible. However, if decontamination is necessary, the following procedures will be used. Decontamination of nondisposable sampling equipment that comes in contact with samples (i.e., sleeve rings and the split-spoon sampling device) will be performed to prevent the introduction of extraneous material into samples, and to prevent cross-contamination between samples. If required, sampling equipment will be decontaminated by steam cleaning, or by washing with a nonphosphate detergent such as Liquinox™ or equivalent. Decontamination water will be collected in 55-gallon U.S. Department of Transportation-approved drums or a poly-tank.

The following procedures will be used for decontamination of nondisposable sampling equipment:

1. If mud or soil is adhering to the sampling equipment, first rinse with potable water. This step will decrease the gross contamination and reduce the frequency at which the nonphosphate detergent and water solution need to be changed.
2. Wash with the nonphosphate detergent and water solution. This step will remove remaining contamination from the equipment. Dilute the nonphosphate detergent as directed by the manufacturer.
3. Rinse with potable water. Change the water frequently.
4. Rinse with deionized water. This step will rinse any detergent solution and potable water residues. Rinsing will be done by applying the deionized water from a clean squeeze bottle (or equivalent) while holding equipment over a bucket.

14.3 ANALYTICAL REQUIREMENTS

All analytical methods will be performed according to the applicable EPA and DoD QSM (2017) QC requirements (e.g., initial calibrations (ICALs), continuing calibrations, tuning, reagent blanks, surrogates, replicates, and laboratory control sample [LCS]) as described in Worksheets #24 and #28.

14.4 QUALITY CONTROL TASKS

Samples will have appropriate associated QC samples, analyzed as blanks and LCS, as described in Worksheets 12, 20, and 28.

14.5 DATA RECORDING AND TRANSFER

This section details the requirements for data reporting and data package formats that will be provided by the laboratory.

14.5.1 Hard Copy Deliverables

All relevant raw data and documentation, including (but not limited to) logbooks, data sheets, electronic files, and final reports, will be maintained by the laboratory for at least 10 years. The laboratory will notify APTIM 30 days before disposal of any relevant laboratory records.

The hardcopy data deliverable requirements for this project are as follows:

- Radiological characterization samples—90 percent Stage 2B and 10 percent Stage 3
- Wastewater—100 percent Stage 2A

14.5.2 Electronic Deliverables

The laboratory EDD will be in Equis format (APTIM database format). The analytical laboratory will follow the requirements stated in the Laboratory Interface Document for the Analytical Laboratory EDD.

The laboratory will certify that the EDD and the hard copy reports are identical. Both the EDD and the hard copy will present results to two or three significant figures. Field information (e.g., date and time collected, sample identification) will be entered directly into the main database from the COC record or uploaded from electronic files generated in the field.

14.6 DATA MANAGEMENT

This section describes the data management procedures for data review, verification, reporting, and validation.

14.6.1 Data Reduction, Verification, and Reporting

All analytical data generated by the laboratory projects will be reviewed prior to reporting to ensure the validity of reported data. This internal laboratory data review process will consist of data reduction, three levels of documented review, and reporting. Review processes will be documented using appropriate checklist forms, or logbooks, that will be signed and dated by the reviewer.

14.6.2 Data Reduction

Data reduction involves the mathematical or statistical calculations used by the laboratory to convert raw data to the reported data. The laboratory will perform reduction of analytical data as specified in each of the appropriate analytical methods and laboratory SOPs. For each method, all raw data results will be recorded using method-specific forms or a standardized output from each of the various instruments.

All data calculations will be verified and initialed by personnel both generating and approving them. All raw and electronic data, notebook references, supporting documentation, and correspondence will be assembled, packaged, and stored for a minimum of 10 years for future use. All reports will be held client confidential. If the laboratory is unable to store project-related data for 10 years, then it is the responsibility of the laboratory to contact APTIM to make alternative arrangements.

14.6.3 Laboratory Data Verification and Review

The laboratory analyst who generates the analytical data will have the primary responsibility for the correctness and completeness of data. Each step of this verification and review process will involve the evaluation of data quality based on both the results of the QC data and the professional judgment of those conducting the review. This application of technical knowledge and experience to the evaluation of data is essential in ensuring that data of known quality are generated consistently. All data generated and reduced will follow well-documented in-house protocols.

Level 1. Laboratory Technical (Peer) Data Review

Analysts will review the quality of their work based on an established set of guidelines, including the QC criteria established in each method, in this SAP, and as stated within the laboratory DoD QSM (2017). This review, at a minimum, will ensure that the following conditions have been met:

- Sample preparation information is correct and complete.
- Analysis information is correct and complete.
- Appropriate SOPs have been followed.
- Calculations are verified.
- There are no data transposition errors.
- Analytical results are correct and complete.
- QC samples are within established control limits.
- Blanks and LCS are within appropriate QC limits.
- Special sample preparation and analytical requirements have been met.

Documentation is complete, for example, when any anomalies and holding times have been documented, and forms have been completed.

Level 2. Laboratory Technical Data Review

A supervisor or data review specialist whose function is to provide an independent review of data packages will perform this review. This review will also be conducted according to an established set of guidelines and will be structured to verify the following findings of the Level 1 data review:

- Appropriate laboratory SOPs have been followed.
- Calibration data are scientifically sound, appropriate to the method, and completely documented.
- QC samples are within established guidelines.
- Qualitative identification of contaminants is correct.
- Manual integrations are justified and properly documented.
- Quantitative results and calculations are correct.
- Data are qualified correctly.
- Documentation is complete, for example, any anomalies and holding times have been documented, and appropriate forms have been completed.
- Data are ready for incorporation into the final report.
- The data package is complete and complies with contract requirements.

The Level 2 review will be structured so that all calibration data and QC sample results are reviewed, and the analytical results from at least 10 percent of the samples are checked back to the sample preparation and analytical bench sheets. If no problems are found with the data package, the review will be considered complete.

If any problems are found with the data package, an additional 10 percent of the sample results will be checked back to the sample preparatory and analytical bench sheets. This cycle will then be repeated either until no errors are found in the checked data set, or until all data have been checked. All errors and corrections noted will be documented.

Level 3. Laboratory Administrative Quality Assurance Data Review

The laboratory QA Manager will review 10 percent of all data packages. This review should be similar to the review as provided in Level 2, except that it will provide a total overview of the data package to ensure its consistency and compliance with project requirements. All errors noted will be corrected and documented.

14.7 DATA VALIDATION

No additional data validation will be performed for this project.

If radiological characterization samples are collected, these sample results will be validated by a third-party validation company at Stage 2B. Data validation will be in accordance with the

National Functional Guidelines for Inorganic Superfund Data Review (EPA, 2014), the method requirements stated in the DoD QSM (2017) and the QC criteria specified in this SAP. The National Functional Guidelines will be used as the primary guidance for applying data qualifiers. Data will be validated and flagged with the following data qualifiers:

- ***J qualifier*** denotes the analyte was positively identified, but the associated numerical value is estimated.
- ***U qualifier*** denotes the analyte was analyzed for, but not detected. The associated numerical value is at or below the reporting limit.
- ***R qualifier*** denotes the data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.

SAP Worksheet #15.1: Reference Limits and Evaluation Table—Site Contaminants (Soil Matrix—Gamma Isotopes)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						DLC[2]	LOD	DL
Americium-241 (^{241}Am)	86954-36-1	pCi/g	NA	NA	NA	NA	NA	NA
Bismuth-212 (^{212}Bi)	14913-49-6	pCi/g	NA	NA	NA	NA	NA	NA
Bismuth-214(^{214}Bi)	14733-03-0	pCi/g	NA	NA	NA	NA	NA	NA
Cesium-137 (^{137}Cs)	10045-97-3	pCi/g	0.113	Release Criteria	0.07	0.07[2]	NA	NA
Cobalt-60 (^{60}Co)	10198-40-0	pCi/g	NA	NA	NA	NA	NA	NA
Europium-152 (^{152}Eu)	14683-23-9	pCi/g	NA	NA	NA	NA	NA	NA
Europium-154 (^{154}Eu)	15585-10-1	pCi/g	NA	NA	NA	NA	NA	NA
Lead-212 (^{212}Pb)	15092-94-1	pCi/g	NA	NA	NA	NA	NA	NA
Lead-214 (^{214}Pb)	15067-28-4	pCi/g	NA	NA	NA	NA	NA	NA
Potassium-40 (^{40}K)	13966-00-2	pCi/g	NA	NA	NA	NA	NA	NA
Protactinium-234 (^{234}Pa)	15100-28-4	pCi/g	NA	NA	NA	NA	NA	NA
Radium-226 (^{226}Ra)	13982-63-3	pCi/g	1.0 above background[1]	Release Criteria	0.2	0.2[2]	NA	NA
Thallium-208 (^{208}Tl)	14913-50-9	pCi/g	NA	NA	NA	NA	NA	NA
Thorium-232 (^{232}Th)	7440-29-1	pCi/g	NA	NA	NA	NA	NA	NA
Thorium-234 (^{234Th})	15065-10-8	pCi/g	NA	NA	NA	NA	NA	NA
Uranium-235 (^{235}U)	15117-96-1	pCi/g	NA	NA	NA	NA	NA	NA

Notes:

[1] ^{226}Ra background for definitive data is 0.633 picocurie per gram (pCi/g) for this project.

[2] Decision Level Concentration (DLC) at or less than the value listed must be achieved for ^{137}CS and ^{226}Ra for all samples for this project. Project DLC for radiological analyses are calculated on a sample specific basis and will vary. The values listed indicate a minimum DCL that will be achieved. DLC for other radionuclides analyzed by gamma spectroscopy are not required to be achieved unless specifically requested on the applicable COC.

DL	*detection limit*
NA	*not applicable*

SAP Worksheet #15.2: Reference Limits and Evaluation Table—Site Contaminants (Soil Matrix—Strontium-90)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						DLC	LOD	DL
Total Strontium	7440-24-6	pCi/g	0.331	Release Criteria	0.16	0.16	NA	NA
Strontium-90 (^{90}Sr)	10098-97-2	pCi/g	0.331	Release Criteria	0.16	0.16	NA	NA

Notes:

Total strontium analysis will be performed first by the laboratory since all strontium isotopes (not including ^{90}Sr) have decays away since activities involving radioactive material ceased at HPNS. If the total strontium result is less than the release criterion, a ^{90}Sr specific analysis is not required. If the total strontium result is above the release criterion, then a ^{90}Sr specific analysis will be performed.

DL — *detection limit*
NA — *not applicable*

SAP Worksheet #15.3: Reference Limits and Evaluation Table—Site Contaminants (Soil Matrix—Alpha Isotopes)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						DLC	LOD	DL
Plutonium-239/240 ($^{239/240}Pu$)	10-12-8	pCi/g	2.59	Release Criteria	0.10	0.10	NA	NA

Notes:

DL *detection limit*

NA *not applicable*

SAP Worksheet #15.4: Reference Limits and Evaluation Table—Site Contaminants (Soil Matrix—Tritium)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						DLC	LOD	DL
Tritium (Hydrogen-3)	10028-17-8	pCi/g	2.28	Release Criteria	1	1	NA	NA

Notes:

DL — *detection limit*

NA — *not applicable*

SAP Worksheet #15.5: Reference Limits and Evaluation Table—Site Contaminants (Water Matrix)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						LOQ	LOD	DL
Americium-241 (^{241}Am)	86954-36-1	pCi/L	NA	NA	NA	NA	NA	NA
Bismuth-212 (^{212}Bi)	14913-49-6	pCi/L	NA	NA	NA	NA	NA	NA
Bismuth-214(^{214}Bi)	14733-03-0	pCi/L	NA	NA	NA	NA	NA	NA
Cesium-137 (^{137}Cs)	10045-97-3	pCi/L	119	Release Criteria	55	55[1]	NA	NA
Cobalt-60 (^{60}Co)	10198-40-0	pCi/L	NA	NA	NA	NA	NA	NA
Europium-152 (^{152}Eu)	14683-23-9	pCi/L	NA	NA	NA	NA	NA	NA
Europium-154 (^{154}Eu)	15585-10-1	pCi/L	NA	NA	NA	NA	NA	NA
Lead-212 (^{212}Pb)	15092-94-1	pCi/L	NA	NA	NA	NA	NA	NA
Lead-214 (^{214}Pb)	15067-28-4	pCi/L	NA	NA	NA	NA	NA	NA
Potassium-40 (^{40}K)	13966-00-2	pCi/L	NA	NA	NA	NA	NA	NA
Protactinium-234 (^{234}Pa)	15100-28-4	pCi/L	NA	NA	NA	NA	NA	NA
Radium-226 (^{226}Ra)	13982-63-3	pCi/L	5	Release Criteria	2.5	2.5[1]	NA	NA
Thallium-208 (^{208}Tl)	14913-50-9	pCi/L	NA	NA	NA	NA	NA	NA
Thorium-232 (^{232}Th)	7440-29-1	pCi/L	NA	NA	NA	NA	NA	NA
Thorium-234 (^{234Th})	15065-10-8	pCi/L	NA	NA	NA	NA	NA	NA
Uranium-235 (^{235}U)	15117-96-1	pCi/L	NA	NA	NA	NA	NA	NA

Notes:

[1] A minimum detected concentration at or less than the value listed must be achieved for ^{137}Cs and ^{226}Ra for all samples for this project. Minimum detected concentrations for other radionuclides analyzed by gamma spectroscopy are not required to be achieved unless specifically requested on the applicable COC.

LOQ	*limit of quantitation*
NA	*not applicable*
pCi/L	*picocurie per liter*

SAP Worksheet #15.6: Reference Limits and Evaluation Table—Site Contaminants (Water Matrix—Strontium-90)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						LOQ	LOD	DL
Total Strontium	7440-24-6	pCi/L	8	Release Criteria	4	0.16	NA	NA
Strontium-90 (^{90}Sr)	10098-97-2	pCi/L	8	Release Criteria	4	4	NA	NA

Notes:

Total strontium analysis will be performed first by the laboratory since all strontium isotopes (not including ^{90}Sr) have decays away since activities involving radioactive material ceased at HPNS. If the total strontium result is less than the release criterion, a ^{90}Sr specific analysis is not required. If the total strontium result is above the release criterion, then a ^{90}Sr specific analysis will be performed.

LOQ	*limit of quantitation*
NA	*not applicable*
pCi/L	*picocurie per liter*

SAP Worksheet #15.7: Reference Limits and Evaluation Table—Site Contaminants (Water Matrix—Alpha Isotopes)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						LOQ	LOD	DL
Plutonium-239/240 ($^{239/240}Pu$)	10-12-8	pCi/L	15	Release Criteria	7.5	7.5	NA	NA

Notes:

LOQ — *limit of quantitation*
NA — *not applicable*
pCi/L — *picocurie per liter*

SAP Worksheet #15.8: Reference Limits and Evaluation Table—Site Contaminants (Water Matrix—Tritium)

Analyte	CAS Number	Units	Project Action Limit	Project Action Limit Reference	Project Quantitation Limit Goal	Laboratory-Specific		
						LOQ	LOD	DL
Tritium (Hydrogen-3)	10028-17-8	pCi/L	20,000	Release Criteria	1	1	NA	NA

Notes:

LOQ	*limit of quantitation*
NA	*not applicable*
pCi/L	*picocurie per liter*

SAP Worksheet #15.9: Reference Limits and Evaluation Table—Site Contaminants (Swipe Matrix—Gross Alpha/Gross Beta)

Analyte	CAS Number	Units	Removable Surface Contamination Limit	Removal Surface Contamination Limit Reference	Removable Surface Contamination MDC	Laboratory-Specific		
						LOQ	LOD	DL
Gross Alpha	12587-46-1	dpm/ $100cm^2$	20	Regulatory Guide 1.86	14	NA	NA	NA
Gross Beta	12587-47-2	dpm/ $100cm^2$	200	Regulatory Guide 1.86	84	NA	NA	NA

Notes:

Gamma isotopes associated with ^{226}Ra *or other naturally occurring radioactive material (potassium-40 and uranium-235) are reported at the request of RASO even though the release criteria has not been established.*

MDCs are being used in place of limits of quantitation, limits of detection, and detection limits (DLs) for radiochemistry analyses. MDCs are calculated on a per sample, per-analysis basis and take into account instrument background, sample size, and count time. Therefore, any MDC value listed in this worksheet for the radiological analyses is the minimum MDC value that the laboratory will achieve. However, laboratory reports will list the actual MDC value calculated for each isotope.

LOQ	*limit of quantitation*
MDC	*minimum detected concentration*
NA	*not applicable*
dpm/100cm^2	*disintegrations per minute per 100 square centimeters*

SAP Worksheet #16: Project Schedule/Timeline Table

Run Date: 27-Sep-17 Data Date: 15-Sep-17 1 of 1

Activity Name	Original Duration	Start	Finish
DO 4550 Radiological Work Tasks at Parcels C, D-1, and F, Hunters Point Naval Shipya	757	15-Sep-17	15-Sep-20
Work Element 1 - Project Management Support	757	15-Sep-17	15-Sep-20
Project Mgmt - Project Management & Administrative Support	757	15-Sep-17	15-Sep-20
Memorandum of Understanding	756	15-Sep-17	14-Sep-20
Work Element 3 - Planning Documents	757	15-Sep-17	15-Sep-20
Basewide Radiological Support Work and Abbrev. SAP and Work Instructions	757	15-Sep-17	15-Sep-20
Work Instructions (6 total)	757	15-Sep-17	15-Sep-20
Internal Draft Work Plan	4	26-Sep-17	29-Sep-17
Navy Review of Internal Draft Work Plan (21 Calendar Days)	15	02-Oct-17	20-Oct-17
Respond to Navy Comments on the Internal Draft Work Plan	2	23-Oct-17	24-Oct-17
Navy Review and Comment	1	25-Oct-17	25-Oct-17
Issue Final Work Plan	3	26-Oct-17	30-Oct-17
Supporting Planning Documents	34	15-Sep-17	01-Nov-17
Health and Safety Plan (including Site Safety and Health Plan and Accident I	27	26-Sep-17	01-Nov-17
Internal Draft Final HSP/APP	3	26-Sep-17	28-Sep-17
Navy Review of Internal Draft Final HSP/APP	22	29-Sep-17	30-Oct-17
Respond to Navy Comments and Issue Final	2	31-Oct-17	01-Nov-17
Contractor Quality Control (CQC) Plan	32	15-Sep-17	30-Oct-17
Work Element 4 - Field Work Activities	724	01-Nov-17	15-Sep-20
Portal Monitor and Truck Wash	724	01-Nov-17	15-Sep-20
Work Element 6 - Maintenance of Remedies	724	01-Nov-17	15-Sep-20
Maintenance of Radiological Controls, Postings, and Routine Surveys	724	01-Nov-17	15-Sep-20
Stockpile Tracking	724	01-Nov-17	15-Sep-20
Radiological Support to Other Contractors	724	01-Nov-17	15-Sep-20
Radiological Support to Other Contractors	724	01-Nov-17	15-Sep-20
Radiological Awareness Briefings and Incoming and Outgoing Surveys	724	01-Nov-17	15-Sep-20
Radioactive Check Sources	724	01-Nov-17	15-Sep-20
Personal Dosimetery	724	01-Nov-17	15-Sep-20

2018 2019 2020

Project Baseline Bar ◆ ◆ Mile...
Actual Work Su...
Remaining Work
Critical Remaining Work

Project Schedule - Delivery Order: N6247317F4550
Basewide Radiological Support,
Hunters Point Naval Shipyard, San Francisco, CA

APTIM

SAP Worksheet #17: Sampling Design and Rationale

Radiological investigation sampling will be based on guidance in the MARSSIM (NRC et al., 2000) using a systematic sampling approach as described in the following subsections and in the Work Plan.

17.1 WASTE SOIL AND WASTEWATER SAMPLING

Waste characterization sampling for chemical constituents will not be performed as part of this task order.

Waste characterization samples for soil and water will be collected at a frequency based on professional judgment, project scope of work, and in consultation with RASO. At a minimum, the analysis will include the isotopes of concern for the site from which the waste was generated. The established radiological release criteria are listed in the "Release Criteria Table." The "Building/Area Assessment, Classification, and Associated Isotopes of Concern Table" lists the isotopes of concern for buildings, sites, or areas at HPNS that have not achieved free release as of September 25, 2017.

Release Criteria Table

Radionuclide	Total Surface Contamination		Soil[d]		Water [e] (pCi/L)
	Equipment or Waste (dpm/100cm^2)[a]	Structures (dpm/100cm2)[b]	Outdoor Worker (pCi/g)[c]	Residential (pCi/g)[c]	
Americium-241	100	100	5.67	1.36	15
Cesium-137	5,000	5,000	0.113	0.113	119
Cobalt-60	5,000	5,000	0.0602	0.0361	100
Europium-152	5,000	5,000	0.13[f]	0.13[f]	60
Europium-154	5,000	5,000	0.23[f]	0.23[f]	200
Plutonium-239	100	100	14.0	2.59	15
Radium-226	100	100	1.0[g]	1.0[g]	5[h]
Strontium-90	1,000	1,000	10.8	0.331	8
Thorium-232	1,000	36.5	2.7	1.69	15
Tritium	5,000	5,000	4.23	2.28	20,000
Uranium-235	5,000	488	0.398	0.195	30

Source:

Final Basewide Radiological Removal Action, Action Memorandum—Revision 2006, Hunters Point Shipyard, San Francisco, California (Navy, 2006)

Notes:

[a] These limits are based on AEC "Regulatory Guide 1.86" (AEC 1974). Limits for removable surface activity are 20 percent of these values.

[b] These limits are based on 25 mrem/yr, using RESRAD-Building Version 3.3 or "Regulatory Guide 1.86" (AEC 1974), whichever is lower.

c The laboratory will ensure that the MDC meets the listed release criteria by increasing sample size or counting time as necessary. The MDC is defined as the lowest net response level, in counts, that can be seen with a fixed level of certainty, customarily 95 percent. The MDC is calculated per sample by considering background counts, amount of sample used, and counting time.

[d] EPA PRGs for two future-use scenarios.

[e] Release criteria for water have been derived from "Radionuclides Notice of Data Availability Technical Document" (EPA 2000) by comparing the limits from two criteria and using the most conservative limit.

[f] Based on EPA-decay-corrected PRGs for commercial reuse and a previous action memorandum (Tetra Tech EM, Inc., 2000 and 2001).

[g] Limit is 1 pCi/g above background, per agreement with EPA.

[h] Limit is for total radium concentration.

AEC	*Atomic Energy Commission*
cm^2	*square centimeters*
dpm	*disintegrations per minute*
MDC	*minimum detectable concentration*
mrem/yr	*millirem per year*
pCi/g	*picocuries per gram*
pCi/L	*picocuries per liter*
PRG	*preliminary remediation goal*

Building/Area Assessment, Classification, and Associated Isotopes of Concern Table

Building No. or Area	Contamination Potential					Contaminated Media							Potential Migration Pathways							Recommended Action	Isotopes of Concern
	Known-Restricted Access	Known-Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System		
Parcel B																					
IR-07*				√		L	L	N	N	N	N	N	L	L	N	N	N	N	N	Scoping Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
IR-18*				√		L	L	N	N	N	N	N	L	L	N	N	N	N	N	Scoping Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Drydock 5				√		N	N	N	N	N	L	L	N	N	N	N	N	L	L	Scoping Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Drydock 6				√		N	N	N	N	N	L	L	N	N	N	N	N	L	L	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Drydock 7				√		N	N	N	N	N	L	L	N	N	N	N	N	L	L	Scoping Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Parcel C																					
205 and Discharge Channel				√		N	N	N	N	N	L	L	N	N	N	N	N	L	L	Scoping Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
211		√				N	N	N	N	N	M	L	N	N	N	N	N	L	L	Remediation and Final Status Survey	^{137}Cs, ^{226}Ra, and ^{232}Th
224			√			N	N	N	N	N	L	N	N	N	N	N	N	L	N	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, and ^{90}Sr
253		√				N	N	N	N	N	H	H	N	N	N	N	N	M	M	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, ^{226}Ra, ^{90}Sr, and ^{232}Th
Drydock 2			√			N	N	N	N	N	M	L	N	N	N	N	N	L	L	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Drydock 3			√			N	N	N	N	N	M	L	N	N	N	N	N	L	L	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Drydock 4			√			N	N	N	N	N	M	L	N	N	N	N	N	L	L	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr

Building/Area Assessment, Classification, and Associated Isotopes of Concern Table (continued)

Building No. or Area	Contamination Potential					Contaminated Media							Potential Migration Pathways							Recommended Action	Isotopes of Concern
	Known-Restricted Access	Known-Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System		
Parcel D																					
383				√		N	N	N	N	N	L	N	N	N	N	N	N	L	N	Review Final Status Survey Report	Tritium ^{226}Ra, and ^{90}Sr
Gun Mole Pier			√			L	L	N	N	N	L	N	L	L	N	N	N	L	N	Review Characterization Report	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Mahan Street - NRDL			√			M	M	N	N	N	N	N	L	L	N	N	N	N	N	Review Final Status Survey Report	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Parcel E																					
500 Building Series			√			M	H	N	N	N	N	H	L	M	N	N	N	N	H	Scoping Survey	^{241}Am, ^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
510 Site			√			L	L	N	N	N	N	M	L	L	N	N	N	N	L	Characterization Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
510A Site			√			L	L	N	N	N	N	M	L	L	N	N	N	N	L	Scoping Survey	^{137}Cs, ^{90}Sr
517 Site			√			L	L	N	N	N	N	M	L	L	N	N	N	N	L	Characterization Survey	^{60}Co, ^{137}Cs, ^{90}Sr
520 Site		√				M	M	N	N	N	N	M	M	M	N	N	N	N	L	Characterization Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
707/Kennels		√				L	L	N	N	N	L	M	L	L	N	N	N	L	M	Characterization Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
707 B Site				√		L	L	N	N	N	N	N	N	L	N	N	N	N	L	Characterization Survey (as part of 707 Triangle Area)	^{137}Cs, ^{226}Ra, and ^{90}Sr
707 C Site				√		L	L	N	N	N	N	N	L	L	N	N	N	N	N	Characterization Survey (as part of 707 Triangle Area)	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
707 Triangle Area		√				L	H	N	N	N	N	H	L	M	N	N	N	N	M	Characterization Survey	^{137}Cs, ^{239}Pu, ^{226}Ra, ^{90}Sr, and ^{235}U
708				√		L	N	N	N	N	L	N	L	N	N	N	N	N	N	Review Final Status Survey Report	^{137}Cs, ^{90}Sr
719 Site				√		L	L	N	N	N	N	N	L	N	N	N	N	N	N	Scoping Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr

Building/Area Assessment, Classification, and Associated Isotopes of Concern Table (continued)

Building No. or Area	Contamination Potential: Known-Restricted Access	Known-Continued Access	Likely	Unlikely	Unknown	Contaminated Media: Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System	Potential Migration Pathways: Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System	Recommended Action	Isotopes of Concern
Shack 79 Site			√			M	L	N	N	N	N	N	L	L	N	N	N	N	N	Final Status Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
Shack 80 Site		√				H	M	N	N	N	N	N	M	L	N	N	N	N	N	Remediation and Final Status Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
Experimental Shielding Range			√			M	L	N	N	N	N	N	L	L	N	N	N	N	N	Review Final Status Survey Report	^{60}Co, ^{137}Cs, ^{226}Ra
IR-01/21, Industrial Landfill		√				H	H	N	N	N	N	N	M	M	N	N	N	N	N	Review Characterization Survey Report, Remediation, and Final Status Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
IR-02, Bay Fill		√				H	H	N	L	N	N	N	M	M	N	L	N	N	N	Characterization Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
IR-03			√			M	M	N	N	N	N	N	L	L	N	N	N	N	N	Scoping Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
Former Salvage Yard			√			M	M	N	N	N	N	N	L	L	N	N	N	N	N	Scoping Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
Shoreline		√				H	M	L	N	N	N	N	M	M	L	N	N	N	N	Characterization Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr
Basewide																					
Storm Drain Lines		√				N	L	N	N	N	L	H	N	L	N	N	N	L	M	Scoping/Characterization Surveys of systems associated with NRDL sites or sites associated with radium use	^{137}Cs, ^{226}Ra, and ^{90}Sr
Sanitary Lines		√				N	L	N	N	N	L	H	N	L	N	N	N	L	M	Scoping/Characterization Surveys of systems associated with NRDL sites or sites associated with radium use	^{137}Cs, ^{226}Ra, and ^{90}Sr

Building/Area Assessment, Classification, and Associated Isotopes of Concern Table (continued)

Building No. or Area	Contamination Potential					Contaminated Media							Potential Migration Pathways							Recommended Action	Isotopes of Concern
	Known-Restricted Access	Known-Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Surface Water	Groundwater	Air	Structures	Drainage System		
Septic Systems		√				N	M	N	N	N	N	H	N	L	N	N	N	N	M	Scoping/Characterization Surveys of systems associated with NRDL sites or sites associated with radium use	^{137}Cs, ^{226}Ra, and ^{90}Sr
Parcel F																					
Underwater Areas			√			N	L	N	N	N	N	N	L	N	N	N	N	N	N	Scoping Surveys in areas of Operation CROSSROADS decontamination activities and site outfall discharges	^{137}Cs, ^{239}Pu, ^{226}Ra, ^{90}Sr, and ^{235}U
All Ship Berths				√		L	L	N	N	N	L	N	N	L	N	N	N	L	N	Review Final Status Survey Report for completed berths; Scoping Survey on remainder	^{137}Cs, ^{239}Pu, ^{226}Ra, and ^{90}Sr
Off-Site Facility																					
ICW 418				√		N	N	N	N	N	L	N	N	N	N	N	N	L	N	Scoping Survey	^{137}Cs, ^{226}Ra, and ^{90}Sr

Source:

Final Historical Radiological Assessment, History and the Use of General Radioactive Materials, 1939-2003, Hunters Point Shipyard (Navy, 2004)

Notes:

** Received restricted release from the State of California*

H High — *Evidence of contamination in the media or migration pathway has been identified.*

L Low — *The potential for contamination in the type of media or migration pathway is remote.*

M Moderate — *The potential for contamination in the media or migration pathway exists, although the extent has not been fully assessed.*

N None — *Evidence of contamination in the specific media or migration pathway has not been found, or known contamination has been removed, and surveys indicate that the media or migration pathway meets today's release criteria.*

SAP Worksheet #18: Sampling Locations and Methods/Standard Operating Procedures Requirements Table

The sample numbers shown in this worksheet represent the number of samples based on the initial estimated excavation size. Additional samples will be documented on COC Forms and in the field logbook. In addition, all sample locations will be either surveyed using a licensed land surveying company, or using hand-held global positioning system units.

Sampling Location	Purpose	Sample ID Number	Matrix	Depth (feet below ground surface)	Analytical Group	Number of Samples	Sampling SOP Reference
Soil	Radiological characterization	ParcelXX-01 Through ParcelXX-## (sequential as needed)	Soil	Surface (0 to 6 inches)	Gamma Isotopes, ^{90}Sr, Alpha Isotopes, and/or Tritium	As needed	Worksheet #14
Waste Soil	Waste characterization	CH-1 Through CH-## (sequential as needed)	Soil	Not applicable	Gamma Isotopes, ^{90}Sr, Alpha Isotopes, and/or Tritium	As needed, up to 25 samples	Worksheet #14
Wastewater	Radiological characterization of investigation-derived waste water prior to discharge	WW-001 (sequential as needed)	Water	Not applicable	Gamma Isotopes, ^{90}Sr, Alpha Isotopes, and/or Tritium	As needed, up to 25 samples	Worksheet #14

SAP Worksheet #19: Analytical Standard Operating Procedures Requirements Table

Matrix	Analytical Group	Analytical and Preparation Method/ Reference	Sample Volume	Container	Preservation Requirements	Maximum Holding Time
Soil	Gamma Isotopes	EPA 901.1MOD	250 – 400 grams	One 250-mL poly/glass or tuna can	None	180 days
Soil	Total Strontium/ ^{90}Sr	EPA 905.0/ Sr-02	250 – 400 grams	One 250-mL poly/glass or tuna can	None	180 days
Soil	Alphas Isotopes	HASL A-01-R	250 – 400 grams	One 250-mL poly/glass or tuna can	None	180 days
Soil	Tritium	EPA 906.0	250 – 400 grams	One 250-mL poly/glass or tuna can	None	180 days
Waste water	Gamma Isotopes (^{226}Ra only)	EPA Methods 903 and 904	1 L	One 1 L, poly/glass	Nitric Acid pH less than (<) 2	180 days
Waste water	Gamma Isotopes (remainder of list besides ^{226}Ra)	EPA 901.1MOD/DOE HASL 300 Ga-01-R	1 L	One 1 L, poly/glass	Nitric Acid pH<2	180 days
Waste water	Total Strontium/ ^{90}Sr	EPA 905.0/ DOES HASL 300 Sr-02	1 L	One 1 L, poly/glass	Nitric Acid pH<2	180 days
Waste water	Alpha Isotopes	HASL A-01-R	1 L	One 1 L, poly/glass	Nitric Acid pH<2	180 days
Waste water	Tritium	EPA 906.0	1 L	One 1 L, poly/glass	Nitric Acid pH<2	180 days

Notes:

L *liter*

mL *milliliter*

SAP Worksheet #20: Field Quality Control Sample Summary Table

Matrix	Analytical Group	No. of Primary Sampling Locations	No. of Field Duplicates	No. of MS/MSDs	No. of Field Blanks	No. of Equipment Rinse Blanks	No. of Trip Blanks	Total No. of Samples to Laboratory
Soil	Gamma Isotopes Total Strontium Alpha by LSC	1 (collect as necessary)	None	None	None	None	None	25 (estimated)
Wastewater	$^{226}Ra/^{228}Ra$ Gamma Isotopes Total Strontium	1 (collect as necessary)	None	None	None	None	None	25 (estimated)

Notes:

^{228}Ra	*radium-228*
LSC	*liquid scintillation counting*
MSD	*matrix spike duplicate*

SAP Worksheet #21: Project Sampling Standard Operating Procedures References Table

Reference Number	Title	Date, Revision and/or Number	Originating Organization of Sampling SOP	Equipment Type	Modified for Project Work? (Y/N)	Comments
Worksheet #14	Soil Sampling	NA	APTIM	Disposable Scoops	N	
Worksheet #14	Wastewater Sampling	NA	APTIM	Disposable bailer	N	

Notes:

NA *not applicable*

SAP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Verification Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
No field instruments for chemical screening will be used for this project.						
Radiological controls portable instrument procedures are described in detail in the RPP (APTIM, 2017a) and work instructions					Project RSO or designee	APTIM, in progress

SAP Worksheet #23: Analytical Standard Operating Procedures References Table

Laboratory SOP Number[1]	Title, Revision Date, and/or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
ST-RD-0102	Gamma Vision Analysis Rev. 6/22/15	Definitive	Solids Gamma Isotopes (^{226}Ra and ^{137}Cs)	Gamma Spectrometer	TestAmerica	N
ST-RD-0403	Low Background Gas Flow Proportional Counting System Analysis Revision 5/23/16	Definitive	Solids ^{90}Sr	Gas Flow Proportional Counter	TestAmerica	N
ST-RD-0210	Alpha Spectroscopy Analysis Revision 5/23/16	Definitive	Solids Alpha Isotopes (^{226}Ra, ^{238}U)	Alpha Spectrometer	TestAmerica	N
ST-RC-0240	Isotopic Americium, curium, plutonium, thorium, and uranium in various matrices by Eichrom Separation Resin, 6/30/16	Definitive	Soil/Water	Alpha Spectrometer	TestAmerica	N
ST-RC-0058	Soil Sample preparation for Strontium-89, Strontium-90 and total strontium using extraction chromatography, Rev 4/4/16	Definitive	Soil	Gas Flow Proportional Counter	TestAmerica	N
ST-RC-0025	Preparation of samples for gamma spectroscopy, Rev 1/19/16	Definitive	Soil	Gamma Spectrometer	TestAmerica	N

SAP Worksheet #23: Analytical Standard Operating Procedures References Table (continued)

Notes:

[1]Portable document format copies of analytical SOPs will be provided in the Final SAP (Attachment 2).

^{238}U	*Uranium-238*

SAP Worksheet #24.1: Analytical Instrument Calibration Table (Gamma Spectrometry)

Instrument	Calibration Procedure	Frequency	Acceptance Criteria	Corrective Action	Person(s) Responsible for Corrective Actions	SOP Reference
Gamma Spectrometry	ICAL	Prior to initial use, following repair or loss of control and upon incorporation of new or changed instrument settings (*Multi-Agency Radiological Laboratory Analytical Protocols Manual* [MARLAP] 18.5.6.2; EPA et al., 2004)	Verify manufacturer's specifications for gamma peak resolution (MARLAP 18.5.6.2) Efficiency vs. energy for each geometry/matrix 95% confidence limit of the fitted function: less that or equal to (≤) 8% over energy range (MARLAP 18.5.6.2) or peak energy difference is within 0.1 kiloelectron volt (keV) of reference energy for all points Peak full width at half maximum (FWHM) < 2.5 keV at 1332 keV Energy vs. channel slope equation shall be linear and accurate to 0.5 keV	Correct problem, then repeat ICAL	Laboratory Manager/Analyst	ST-RD-0102
	ICAL verification (ICV)	After ICAL for energy/efficiency and prior to analysis of samples	Observed peaks of second source standard fall within plus or minus (±) 10% of ICAL value relative to energy, FWHM, and efficiency	Verify second source standard and repeat ICV to check for errors If that fails, identify and correct problem and repeat ICV or ICAL and ICV as appropriate	Laboratory Manager/Analyst	

SAP Worksheet #24.1: Analytical Instrument Calibration Table (Gamma Spectrometry) (continued)

Instrument	Calibration Procedure	Frequency	Acceptance Criteria	Corrective Action	Person(s) Responsible for Corrective Actions	SOP Reference
Gamma Spectrometry (continued)	Continuing calibration verification (CCV) (Daily Check)	Daily or prior to use When working with long count times or batch sequences that run more than a day, CCV is performed at the beginning and end of each analytical batch as long as it no longer than a week	Verify peak shift within tolerance limit; verify efficiency within control parameters; verify resolution in tolerance limit Response checks shall have a tolerance limit or control chart set at ± 3% or 3σ of the mean (MARLAP 18.5.6.2); or peak Energy/Efficiency: low, mid, and high energies within 10% of the ICAL value; FWHM: low, mid, and high energies within 10% of initial FWHM value	Correct problem, rerun CCV If that fails, then repeat ICAL Reanalyze all samples since the last successful calibration verification	Laboratory Manager/Analyst	ST-RD-0102
	Background subtraction count (BSC) measurement (long count for subtracting background from blanks or test sources)	Immediately after ICAL and then performed on at least a monthly basis (MARLAP 18.5.6.2)	Statistical test of successive counts and count rates for identified background peaks show no significant difference (MARLAP 18.5.6.2)	Recount and check control chart for trends Determine cause, correct problem, re-establish BSC If background activity has changed, re-establish BSC and reanalyze or qualify all impacted samples since last acceptable BSC	Laboratory Manager/Analyst	

SAP Worksheet #24.2: Analytical Instrument Calibration Table (Alpha Spectrometry)

Instrument	Calibration Procedure	Frequency	Acceptance Criteria	Corrective Action	Person(s) Responsible for Corrective Actions	SOP Reference
Alpha Spectrometry	ICAL	Prior to initial use, following repair or loss of control and upon incorporation of new or changed instrument settings (MARLAP 18.5.6.2; EPA et al., 2004)	Verify manufacturer's specifications for source efficiency (MARLAP); and two calibration peaks that are: 1) greater than or equal to (≥)700 keV apart; or 2) that bracket all peaks to be determined Energy vs. channel slope equation <15 keV per channel Full Width –Half Maximum (FWHM) <100 keV for each peak used for calibration Minimum of 3,000 net counts in each peak	Correct problem, then repeat ICAL	Laboratory Manager/Analyst	ST-RD-0210
	ICV	After ICAL	Determine peak location, resolution, and radionuclide of interest/alpha peak efficiency (where counting efficiency is an analytical requirement) using at least two alpha peaks (MARLAP 18.5.6.3) Or Observed peak centroid falls within ±20 keV from reference energyfor each peak used in the initial energy calibration FWHM ≤100 keV and within ±20 keV of corresponding calibration peaks in initial energy calibration	Repeat ICV to check for error If that fails, identify and correct problem and repeat ICV or ICAL and ICV, as appropriate	Laboratory Manager/Analyst	

SAP Worksheet #24.2: Analytical Instrument Calibration Table (Alpha Spectrometry) (continued)

Instrument	Calibration Procedure	Frequency	Acceptance Criteria	Corrective Action	Person(s) Responsible for Corrective Actions	SOP Reference
Alpha Spectrometry (continued)	CCV (Pulsar Check)	Pulsar energy verification weekly, prior to analysis of samples Use either pulsar check or check source	Energy response check shall have a tolerance limit set at ± 3% or control chart set at ± 3σ (MARLAP 18.5.6.3) or observed peak centroid falls ≤20 keV from reference energy	Recount and check control chart for trends Determine cause, correct problem, and repeat CCV and all associated samples since last successful CCV	Laboratory Manager/Analyst	ST-RD-0210
	CCV (Check Source)	Weekly source check verification prior to analysis of samples Use either pulsar check or check source	Response checks shall have a tolerance limit or control chart set at ± 3% or 3σ (MARLAP 18.5.6.3) or observed peak centroid falls within 20 keV from reference energy for each peak used in the initial energy calibration FWHM ≤100 keV and within 30 keV of corresponding calibration peaks in initial energy calibration	Recount and check control chart for trends Determine cause, correct problem, and repeat CCV and all associated samples since last successful CCV	Laboratory Manager/Analyst	

SAP Worksheet #24.3: Analytical Instrument Calibration Table (Alpha Spectrometry) (continued)

Instrument	Calibration Procedure	Frequency	Acceptance Criteria	Corrective Action	Person(s) Responsible for Corrective Actions	SOP Reference
Alpha Spectrometry (continued)	BSC	Prior to initial use or after ICAL and monthly (MARLAP 18.5.6.3)	Within ±3σ of mean activity of recent BSCs for total radionuclide of interest for all isotopes of interest (minimum of three BSC values)	Recount and check control chart for trends Determine cause, correct problem, re-establish BSC If background activity has changed, re-establish BSC and reanalyze or qualify all impacted samples since last acceptable BSC	Laboratory Manager/Analyst	ST-RD-0210

SAP Worksheet #25: Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
Gamma Spectroscopy	Efficiency check	CCV count	Multipoint	Daily	±3 standard deviations	Recount	Analyst/ Department Manager	ST-RD-0102
Gamma Spectrometer	1. Clean cave; fill dewar with nitrogen gas 2. QA check	1. Physical check 2. Background and source check	1. Physical check 2. Check deviation	1. Weekly 2. Daily	1. Acceptable background 2. Within 2 sigma of measured population	Recalibrate Instrument maintenance Consult with Technical Director	Analyst/ Department Manager	ST-RD-0102
Gas Flow Proportional Counting	1. Check counting gas and change when < 500 pounds per square inch. 2. QA check	1. Physical check 2. Background and source check	1. Physical check 2. Check deviation	1. Weekly 2. Daily	1. Acceptable background 2. Within 2 sigma of measured population	Recalibrate Instrument maintenance Consult with Technical Director	Analyst/ Department Manager	ST-RD-0403
	Efficiency check	CCV count	Multipoint	Daily	±3 standard deviations	Recount	Analyst/ Department Manager	ST-RD-0102

SAP Worksheet #26: Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): APTIM—Field Technician
Sample Packaging (Personnel/Organization): APTIM—Field Technician
Coordination of Shipment (Personnel/Organization): APTIM—Field Technician
Type of Shipment/Carrier: Laboratory Courier—UPS or FedEx
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization):TestAmerica (Sample Receiving)
Sample Custody and Storage (Personnel/Organization): TestAmerica (Sample Receiving)
Sample Preparation (Personnel/Organization): Subcontract Laboratory— TestAmerica Analytical Chemist
Sample Determinative Analysis (Personnel/Organization): Subcontract Laboratory— TestAmerica Analytical Chemist
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Shipped to laboratory the same day as collection if possible, if not possible to ship the same day; storage on site in refrigerator or ice-packed cooler in locked building
Laboratory Sample Storage (No. of days from sample collection): Minimum three months TestAmerica
Sample Extract/Digestate Storage (No. of days from extraction/digestion): 30 days— TestAmerica
Biological Sample Storage (No. of days from sample collection): Not applicable to this project
SAMPLE DISPOSAL
Personnel/Organization: TestAmerica
Number of Days from Analysis: Three months

SAP Worksheet #27: Sample Custody Requirements Table

27.1 SAMPLE CUSTODY AND DOCUMENTATION

Sampling information will be recorded on a COC Form and in a permanently bound field logbook. All entries will be legible and recorded in indelible ink.

27.2 SAMPLE LABELING

Sample labels will be filled out with indelible ink and affixed to each sample container. Non-waterproof sample labels will be covered with clear tape. Sample containers will be placed in resealable plastic bags to protect the sample from moisture during transportation to the laboratory.

Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock)
- Project number
- Sampler’s initials
- Analyses to be performed
- Preservation (if any)
- Location (i.e., site name)

27.3 CHAIN OF CUSTODY

An example COC Form is shown in Attachment 1. In addition to providing a custody exchange record for the samples, the COC Form serves as a formal request for sample analyses. The COC will be completed, signed, and distributed as follows:

- One copy retained by the sample coordinator for inclusion in the project files
- Original sent to the analytical laboratory with the sample shipment

After the laboratory receives the samples, the Sample Custodian will inventory each shipment before signing for it, and note on the original COC Form any discrepancy in the number of samples, temperature of the cooler, or broken samples. The Project Chemist will be notified immediately of any problems identified with shipped samples. The Project Chemist will in turn notify the Project QC Manager, and together they will determine the appropriate course of action. The Project Chemist will also notify the PM if the project budget and schedule may be impacted.

The laboratory will initiate an internal COC Form that will track the sample within the various areas of the laboratory. The relinquishing signature of the Sample Custodian and the custody acceptance signature of the laboratory personnel transfer custody of the sample. This procedure is followed each time a sample changes hands. The laboratory will archive the samples and maintain their custody as required by the contract, or until further notification from the Project Chemist, at which time the samples will either be returned to the project for disposal, or disposed by the laboratory.

27.4 SAMPLE PACKING AND SHIPMENT

After sample collection, sample labels will be affixed to each sample container. Each sample will be placed in a resealable plastic bag to keep the sample container and the label dry. All glass sample containers will be protected with bubble wrap (or other cushioning material) to prevent breakage. A temperature blank will be placed in every cooler with samples.

All sample containers from radiological areas will be screened in the field prior to shipping to the laboratory following Work Instruction WI-40113 of the RPP (APTIM, 2017a). The field exposure rate collected on the sample container is entered on the COC. Samples to be shipped by commercial carrier will be packed in a sample cooler lined with a plastic bag. Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage. Saturday deliveries will be coordinated with the laboratory.

If samples are picked up by a laboratory courier service, the COC Form will be completed and signed by the laboratory courier. The cooler will then be released to the courier for transportation to the laboratory.

If a commercial carrier is used, the COC Form will include the air bill number in the “Transfers Accepted By” column, and will be sealed in a resealable bag. The COC Form will then be taped to the inside of the sample cooler lid. The cooler will be taped shut with strapping tape, and two custody seals will be taped across the cooler lid. Clear tape will be applied to the custody seals to prevent accidental breakage during shipping. The samples will then be shipped to the analytical laboratory. A copy of the courier air bill will be retained for documentation.

The shipping of samples to the analytical laboratory by land delivery services will be performed according to the U.S. Department of Transportation regulations. The International Air Transportation Association regulations will be adhered to when shipping samples by air courier services. Transportation methods will be selected to ensure that the samples arrive at the laboratory in time to permit testing according to established holding times and project schedules. No samples will be accepted by the receiving laboratory without a properly prepared COC Form and properly labeled and sealed shipping container(s).

27.5 FIELD LOGBOOKS

A permanently bound field logbook with consecutively numbered pages will be assigned to this project. A sample collection log work sheet is provided in Attachment 1. All entries will be recorded in indelible ink. Corrections will be made following the procedure described in Section 27.6. At the end of each workday, the responsible sampler will sign the logbook pages, and any unused portions of a logbook page will be crossed-out, signed, and dated.

At a minimum, the logbook will contain the following information:

- Project name and location (on the front page of the log book)
- Date and time of collection for each sample (in the upper right corner of each page)
- Sample number
- Sample location (i.e., soil boring or sampling point)
- Sample type (i.e., soil and water)
- Composite or grab
- Composite type (the number of grab samples)
- Depth of sample
- Weather information (e.g., rain, sunny, approximate temperature)
- Containers used and requested analyses

In the graph paper portion of the field logbook, the sampler will fill in the following information:

- A map with sample locations (drawn or paste copy). Each sample location must be clearly identified on the map. Several sample locations may be presented on one map; however, the page with the map must be referred on each of the individual sample pages.
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments.
- Descriptions of deviations from this SAP.
- Problems encountered and corrective action taken.
- Identification of field QC samples.
- List of QC activities.
- Verbal or written instructions from the Navy and APTIM Project QC Manager.

The sampler will cross-out the unused portion and sign each page.

27.6 DOCUMENT CORRECTIONS

Changes or corrections on any project documentation will be made by crossing-out the item with a single line, initialing by the person performing the correction, and dating the correction. The original item, although erroneous, will remain legible beneath the cross-out. The new information will be written above the crossed-out item. Corrections will be written clearly and legibly with indelible ink.

SAP Worksheet #28.1: Laboratory Quality Control Samples Table (Gamma Isotopes)

Matrix: Solid/Water

Gamma Radionuclides

EPA 901.1M/SOP ST-RD-0102

QC Check	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Actions	Data Quality Indicator	Measurement Performance Criteria
Method Blank	One per analytical batch	$\|Z_{Blank}\| \leq 3$ for blank subtracted (net) activity in all radionuclides of interest (MARLAP 18.4.1; EPA et al., 2004) Or No analytes detected great er than (>) 2 times the blank combined standard uncertainty Blank result must not otherwise affect sample results	Recount the blank to confirm results, unless all sample results are >5 times the blank activity Inspect method blank control chart for indication of significant bias If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory Manager/Analyst	A means of assessing the existence and magnitude of contamination introduced via the analytical process	No analytes detected > 2 times the blank combined standard uncertainty. Blank result must not otherwise affect sample results
LCS	One per analytical batch	$\|Z_{LCS}\| \leq 3$. Investigate recurrent results with $\|Z_{LCS}\| \geq 2$ (MARLAP 18.4.3) Or Use in-house control chart limits of ± 3σ of the mean In-house control limits may not fall more than 25% from the known LCS value	Recount the LCS to confirm results Inspect LCS control chart for indication of significant bias If required, reprep and reanalyze the LCS and all associated samples	Laboratory Manager/Analyst	Accuracy	In-house control chart limits of ± 3σ of the mean. In-house control limits may not fall more than 25% from the known LCS value.

SAP Worksheet #28.1: Laboratory Quality Control Samples Table (Gamma Isotopes) (continued)

Matrix: Solid/Water

Gamma Radionuclides

EPA 901.1M/SOP ST-RD-0102

QC Check	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Actions	Data Quality Indicator	Measurement Performance Criteria
Sample Duplicate	One per analytical batch	|ZDup | ≤ 3. Investigate recurrent results with |ZDup|≥ 2 (MARLAP 18.4.1; EPA et al., 2004) Or the duplicate error ratio (DER) between the sample and the duplicate is <3; or the relative percent difference (RPD) is <25%	Check for lab error. Examine the project-specific requirements Contact the client as to additional measures to be taken	Laboratory Manager/ Analyst	Precision	The DER between the sample and the duplicate is <3; or the RPD is <25%

SAP Worksheet #28.2: Laboratory Quality Control Samples Table (Gas Flow Proportional Counting Isotopes)

Matrix: Solid/Water

Beta Emitting Radionuclides

EPA 901.1/ST-RD-0403

QC Check	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Actions	Data Quality Indicator	Measurement Performance Criteria
Instrument Contamination Check	Daily or when working with long count times, before and after each analytical batch Check after counting high activity samples	Use a statistical test to determine a change in the background count rate value (MARLAP 18.5.6.4; EPA et al., 2004) Or within ±3σ of mean activity of recent BSCs (minimum of 3 BSCs)	Recount the background. If still out of control, locate and correct problem; reanalyze or qualify all impacted samples since last acceptable instrument contamination check If background activity has changed, re-establish BSC and reanalyze samples	Laboratory Manager/ Analyst	A means of assessing the existence and magnitude of contamination introduced via the analytical process	Within ±3σ of mean activity of recent BSCs (minimum of three BSCs)
LCS	One per analytical batch	$\lvert Z_{LCS} \rvert \leq 3$. Investigate recurrent results with $\lvert Z_{LCS} \rvert \geq 2$ (MARLAP 18.4.3; EPA et al., 2004) Or use in-house control chart limits of ± 3σ of the mean In-house control limits may not fall more than 25% from the known LCS value	Recount the LCS to confirm results. Inspect LCS control chart for indication of significant bias If required, reprep and reanalyze the LCS and all associated samples	Laboratory Manager/ Analyst	Accuracy	$\lvert Z_{LCS} \rvert \leq 3$. Investigate recurrent results with $\lvert Z_{LCS} \rvert \geq 2$ Or Use in-house control chart limits of ± 3σ of the mean not more than 25% from the known LCS value.

SAP Worksheet #28.2: Laboratory Quality Control Samples Table (Gas Flow Proportional Counting Isotopes) (continued)

Matrix: Solid/Water

Beta Emitting Radionuclides

EPA 901.1/ST-RD-0403

QC Check	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Actions	Data Quality Indicator	Measurement Performance Criteria
MS	One per preparatory batch (MS not required when yield tracers are employed)	If activity of the MS > 5 times the unspiked sample, |ZMS |≤ 3 (MARLAP 18.4.3; EPA et al., 2004) Or within 60-140% recovery	Examine the project-specific requirements Contact the client as to additional measures to be taken	Laboratory Manager/ Analyst	Accuracy	If activity of the MS > 5 times the unspiked sample, |ZMS |≤ 3 (MARLAP 18.4.3) or Within 60-140% recovery
Sample Duplicate	One per analytical batch	|ZDup | ≤ 3. Investigate recurrent results with |ZDup|≥ 2 (MARLAP 18.4.1) Or the DER between the sample and the duplicate is <3; or the RPD is <25%.	Check for lab error. Examine the project-specific requirements Contact the client as to additional measures to be taken	Laboratory Manager/ Analyst	Precision	Act < 5*MDC, then RPD is 100% or less. If act > 5*MDC, then RPD is 25% or less or DER</=3

SAP Worksheet #28.3: Laboratory Quality Control Samples Table (Alpha Spectroscopy)

Matrix: Solid/Water						
Isotopic Uranium						
DOE A-01-R MOD/SOP ST-RD-0210						
QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Actions	Data Quality Indicator	Measurement Performance Criteria
Method Blank	One per preparatory batch (MARLAP 18.4.1; EPA et al., 2004)	|ZBlank |≤ 3. Investigate recurrent results with |ZBlank| ≥ 2 (MARLAP 18.4.1) Or in-house control limits of ±3 σ of the mean	Recount the blank to confirm results. Inspect method blank control chart for indication of significant bias If required, reprep and reanalyze method blank and all samples processed with the contaminated blank	Laboratory Manager/ Analyst	Accuracy	|ZBlank |≤ 3. Investigate recurrent results with |ZBlank| ≥ 2 Or In-house control limits of ±3 σ of the mean
LCS	1 per preparatory batch	$\|Z_{LCS}\|$≤ 3. Investigate recurrent results with $\|Z_{LCS}\|$≥ 2 (MARLAP 18.4.3) Or use in-house control chart limits of ± 3σ of the mean In-house control limits may not fall more than 25% from the known LCS value.	Recount the LCS to confirm results Inspect LCS control chart for indication of significant bias If required, reprep and reanalyze the LCS and all associated samples	Laboratory Manager/ Analyst	Accuracy	Control chart limits of ± 3σ of the mean In-house control limits may not fall more than 25% from the known LCS value

SAP Worksheet #28.3 Laboratory Quality Control Samples Table (Alpha Spectroscopy) (continued)

Matrix: Solid/Water
Isotopic Uranium
DOE A-01-R MOD/SOP ST-RD-0210

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Actions	Data Quality Indicator (DQI)	Measurement Performance Criteria
MS	One per preparatory batch (MS not required when yield tracers are employed)	If activity of the MS > 5 times the unspiked sample, |ZMS |≤ 3 (MARLAP 18.4.3) Or within 60-140% recovery	Examine the project-specific requirements Contact the client as to additional measures to be taken	Laboratory Manager/ Analyst	Accuracy	If activity of the MS > 5 times the unspiked sample, |ZMS |≤ 3 (MARLAP 18.4.3) Or within 60-140% recovery
Sample Duplicate	One per analytical batch	|ZDup | ≤ 3. Investigate recurrent results with |ZDup|≥ 2 (MARLAP 18.4.1) Or the DER between the sample and the duplicate is <3; or the RPD is <25%	Check for lab error. Examine the project-specific requirements Contact the client as to additional measures to be taken	Laboratory Manager/ Analyst	Precision	RPD is 25% or less or DER</=3

SAP Worksheet #29: Project Documents and Records Table

Document	Where Maintained
Final Work Plan and SAP	APTIM project file (APTIM Concord, California office) NAVFAC SW Environmental Restoration Program Record File for CERCLA sites
Field notes/logbook	APTIM project file(APTIM Concord, California office) NAVFAC SW Environmental Restoration Program Record File for CERCLA sites
COC Forms	APTIM project file (APTIM Concord, California office) NAVFAC SW Environmental Restoration Program Record File for CERCLA sites
Laboratory raw data package	APTIM project file (APTIM Concord, California office) NAVFAC SW Environmental Restoration Program Record File for CERCLA sites
Audit/assessment checklists/reports	APTIM project file(APTIM Concord, California office) and laboratory NAVFAC SW Environmental Restoration Program Record File for CERCLA sites
Corrective action forms/reports	APTIM project file (APTIM Concord, California office) and laboratory
Laboratory equipment calibration logs	APTIM project file (APTIM Concord, California office) and laboratory
Sample preparation logs	APTIM project file (APTIM Concord, California office) and laboratory
Run logs	APTIM project file (APTIM Concord, California office) and laboratory
Sample disposal records	APTIM project file (APTIM Concord, California office) and laboratory
Data validation reports and validated data	APTIM project file (APTIM Concord, California office) NAVFAC SW Environmental Restoration Program Record File for CERCLA sites

SAP Worksheet #30: Analytical Services Table

Matrix	Analytical Group	Sample Locations/ ID Numbers	Analytical Method	Data Package Turnaround Time	Laboratory/Organization[1] (Name, Address, Contact, and Telephone No.)	Backup Laboratory (Name, Address, Contact, and Telephone No.)
Soil	All	All radiological samples shown in Worksheets #18 and 19	All	7 to 28 calendar days	Test America St. Louis Laboratory Contact: Erika Gish 13715 Rider Trail North Earth City, Missouri 63045 314.298.8566	Curtis & Tompkins 2323 5th Street Berkeley, California 94710 510.486.0900
Water	All	All radiological samples shown in Worksheets #18 and 19	All	7 to 28 calendar days	Test America St. Louis Laboratory Contact: Erika Gish 13715 Rider Trail North Earth City, Missouri 63045 314.298.8566	Curtis & Tompkins 2323 5th Street Berkeley, California 94710 510.486.0900

Notes:

[1] All analytical laboratories performing analyses will be State of California and DoD Environmental Laboratory Accreditation Program-accredited laboratories.

SAP Worksheet #31: Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment	Person(s) Responsible for Responding to Assessment Findings	Person(s) Responsible for Identifying and Implementing Corrective Actions	Person(s) Responsible for Monitoring Effectiveness of Corrective Actions
Laboratory Technical Systems Audit	If deemed necessary prior to start of sampling activities	External	APTIM	APTIM Project or Program Chemist	Laboratory QA Officer	Laboratory QA Officer	Laboratory QA Officer and APTIM Project Chemist
Initial Inspection/Preparatory Meeting	Prior to the start of sampling activities	Internal	APTIM	APTIM Project or Program Chemist	Project Chemist or Sample Technician	Project Chemist or Sample Technician	Program Chemist or QC Manager
Field audits	As needed as the project progresses	Internal	APTIM and/or Navy QA Officer	APTIM Project or Program Chemist	Project Chemist or Program Chemist	Project Chemist or Program Chemist	Project Chemist or Program Chemist
Field documentation review	At least once at the beginning of sampling activities and then as needed as the project progresses	Internal	APTIM	APTIM Program Chemist or Field QA Manager	APTIM PM; Field Sampling Technician or Project Chemist	APTIM PM; Field Sampling Technician or Project Chemist	APTIM Program Chemist or Field QA Manager

SAP Worksheet #32: Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response	Timeframe for Response
Field Sampling Technical Systems Audit	Written Audit Report	Project PM	48 hours after audit	Email or letter	Field Technician, APTIM Project Chemist, APTIM Program Chemist	24 hours after notification
Off-Site Laboratory Audit (if performed for project)	Written Audit Report	Laboratory QA Manager, Laboratory PM (TestAmerica St. Louis)	5 days after audit	Corrective Action Plan	Field Technician, APTIM Project Chemist, APTIM Program Chemist	10 business days after receiving report
Laboratory Data Review Findings	Memorandum	Laboratory QA Manager, Laboratory PM (TestAmerica St. Louis)	48 hours after audit	Email or letter	Field Technician, APTIM Project Chemist, APTIM Program Chemist	3 days after notification

SAP Worksheet #33: QA Management Reports Table

Type of Report	Frequency	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation	Report Recipient(s)
Field Sampling Technical System Audit Report	At least once at the beginning of sampling activities and then as needed as the project progresses	Within 24 hours of field sampling audit	APTIM I QA Manager or APTIM Project Chemist	APTIM PM
Off-Site Laboratory Technical System Audit Report (if performed)	Prior to sample receipt at laboratory	Within 48 hours of on-site audit	APTIM Project Chemist or APTIM Program Chemist	Laboratory QA Manager, Laboratory PM
Data Review Report	After all waste sample data reviewed by Project Chemist	As received from laboratory	APTIM Project Chemist or APTIM Program Chemist	APTIM PM
Final Project Report (if needed)	After completion of all field work	Project document delivery schedule is provided in the Work Plan	APTIM PM	Navy RPM and regulatory agencies (see distribution list)

SAP Worksheets #34-36: Data Verification and Validation (Steps I and IIa/IIb) Process Table

Data Review Input	Description	Responsible for Verification	Step I/IIa/IIb[1]	Internal/External
COC Forms	COC Forms will be reviewed internally upon their completion and verified against the packed sample coolers they represent. The shipper's signature on the COC Form should be initialed by the reviewer, a copy of the COC Form retained in the project file, and the original and remaining copies taped inside the cooler for shipment.	Field sampling team leader (APTIM) or Project Chemist	Step I	Internal
Sample receipt	The sample cooler will be checked for compliance with preservative, temperature and packaging requirements. Sample containers will be reviewed against the COC for agreement. Sample receipt will be documented by the laboratory on a login sheet and sample information will be entered into the Laboratory Information Management System.	Laboratory sample receiving and PM	Step I	External
Field notes/logbook	Field notes will be reviewed internally and placed in the project file upon project completion.	APTIM Project Chemist and Field QC Manager	Step I	Internal
Audit reports	Upon report completion, a copy of all audit reports will be placed in the project file. If corrective actions are required, a copy of the documented corrective action taken will be attached to the appropriate audit report in the project file. At the beginning of each week, and at the completion of the site work, project file audit reports will be reviewed internally to ensure that all appropriate corrective actions have been taken and that corrective action reports are attached. If corrective actions have not been taken, the PM will be notified to ensure action is taken.	APTIM PM	Step I	Internal
Laboratory data packages	All laboratory data packages will be verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal. All received data packages will be verified by the APTIM Chemist and a third-party reviewer according to the data validation procedures specified in this SAP.	Laboratory PM and APTIM Project Chemist	Step I	Internal/External

SAP Worksheets #34-36: Data Verification and Validation (Steps I and IIa/IIb) Process Table (continued)

Data Review Input	Description	Responsible for Verification	Step I/IIa/IIb[1]	Internal/External
EDD	All EDDs will be verified internally by the subcontract laboratory for completeness and technical accuracy prior to submittal to APTIM. All received EDDs will be verified APTIM and/or the validation company against the hardcopy laboratory reports.	Laboratory, APTIM Chemist and a third-party data validation company	Step I	Internal/External
Sampling methods and procedures	Ensure that the required sampling methods were used to collect project samples, any field changes or deviations are noted in the field logbook. Review field sample collection logbooks for compliance with the approved SAP.	APTIM Project Chemist and Field QC Manager	Step IIa	Internal
Holding times	Ensure the samples were analyzed within the EPA holding times. If holding times were not met, verify that deviations were documented and proper notifications were made.	Laboratory PM	Step IIa	External
Analytes and project DLCs met	Ensure that the required list of analytes and that project-specific DLCs specified in this SAP are met and reported per project requirements.	Laboratory PM and Project Chemist	Step IIa	Internal/External
Hard copy data packages	Review data package for completeness	Third party validation company	Step IIb	External
Documentation of all SAP QC sample results	Determine if all SAP required QC samples were collected and met required control limits per SAP and DoD QSM (2017) requirements when applicable.	Third party validation company	Step IIb	External
Sampling Plan	Determine whether the SAP was executed as specified (number, location, type of field samples collected).	APTIM Project QC Manager or Project Chemist	Step IIb	Internal
Characterization Radiological Analyses	Review/validate laboratory data package for compliance with EPA Method requirements (1996, 2008), DoD QSM (2017) and requirements in this approved SAP.	Third party validation company	Step IIb	External

SAP Worksheets #34-36: Data Verification and Validation (Steps I and IIa/IIb) Process Table (continued)

Notes:

[1] IIa = compliance with methods, procedures, and contracts (see Table 10, page 117, Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs [EPA, 2005]).

IIb = comparison with measurement performance criteria in the SAP (see Table 11, page 118, Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs [EPA, 2005]).

SAP Worksheets #34-36: Data Verification and Validation (Steps I and IIa/IIb) Process Table (continued)

VALIDATION OF LABORATORY DATA

Data validation is a systematic, independent process of reviewing a body of data to determine the analytical limitations of that data based on specific QC criteria. A third-party data validation company will validate definitive-level project laboratory data for radiological characterization samples if collected at 90 percent Stage 2B and 10 percent Stage 4.

Wastewater and waste soil sample data will not be validated by a third-party validation company, but will be reviewed by the APTIM Project Chemist.

Data review and validation will be in accordance with the QA requirements and control limits specified in this project-specific Quality Assurance Project Plan and the following guidance, as appropriate to the analytical methods used:

- DoD QSM (2017)
- *National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2014)

The Chemist or reviewer's professional judgment will be used to evaluate data quality when called for in the National Functional Guidelines. Professional judgment will also be used where no clear policy exists, or when there is conflicting guidance on how data should be qualified.

Stage 2B and Stage 3 Data Validation Criteria and Checklist

For a Stage 2B data validation effort data quality is assessed by comparing the parameters listed below to the appropriate criteria (or limits) as specified in the project SAP, DoD QSM (2017), or by EPA Method-specific requirements. If calculations for quantitation are verified, it is done on a limited basis requires raw data (Stage 3) in addition to the standard data forms normally present in a data package.

Data review/validation may include the following QC elements shown in the following example validation checklist (depending on the analysis being reviewed):

Pass/Fail QC Criteria	Review/Validation Criteria (Stage 2B and 3)
	Sample Receipt and Preservation
	Sample Holding Times
	Laboratory MBs/Calibration Blanks/Instrument Blanks
	LCS/LCSD Recoveries
	MS/MSD Sample Recoveries (if applicable)

Pass/Fail QC Criteria	Review/Validation Criteria (Stage 2B and 3)
	RPD Evaluation
	Sample Duplicate Evaluation
	ICALs
	Continuing calibration verification
	Analyte quantitation (calculation check)—Level 4 Validation only

SAP Worksheet #37: Usability Assessment

37.1 DATA QUALITY ASSESSMENT REPORT

Based on data validation/review, the Project Chemist or PRSO will determine if the project DQOs have been met and will determine data usability. To reconcile the collected data with project DQOs and to establish and document data usability, the data will be reviewed against data quality indicators (Section 37.2).

If necessary, the Project Chemist will prepare a data quality assessment (DQA) report. The DQA report will cover the following topics:

- Implementation of sampling design and analysis according to the approved SAP (or sample completeness and representativeness)
- Proper frequency of field QC samples and the adequacy of field decontamination procedures
- Accuracy and precision of the data collected
- Data comparability, if appropriate
- Data usability for project decisions

The DQA report will be included in the final project report.

37.2 DATA QUALITY INDICATORS

This section defines the data quality indicators and their use for assessment of data quality.

37.2.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. The following equation illustrates the method for calculating the RPD to assess a method's precision:

$$\textit{Precision as RPD} \quad = \quad \frac{2 \times |\textit{Result-Duplicate Result}| \times 100\%}{\textit{Result + Duplicate Result}}$$

The laboratory uses MS/MSD pairs to assess the precision of analytical procedures, with one MS/MSD pair analyzed for every batch of up to 20 samples. According to the Navy requirements, analytical laboratories perform MS/MSD on the Navy project samples. This allows determining whether matrix interferences may be present.

The laboratory uses laboratory control sample/duplicate pairs when MS are not practical due to the nature of sample or analytical method used, and they are prepared and analyzed with each batch of samples instead of MS/MSD. The laboratory control sample/duplicate may also be prepared in place of MS/MSD in the case that a sufficient sample volume was not obtained in the field to perform the MS/MSD analysis. For inorganic analyses, analytical precision is usually calculated based on the sample and sample duplicate results.

Analytical laboratory will use DoD QSM acceptability limits for RPDs if available (2017). If DoD limits are not available, then the laboratory will establish statistically based acceptability limits for RPDs for each method of analysis and sample matrix. The laboratory will review the QC samples to ensure that internal QC data lies within the limits of acceptability. Any suspect trends will be investigated and corrective actions taken.

The analytical laboratory will use DoD QSM (2017) control limits if available; otherwise, the laboratory will have statistically based acceptability limits for RPDs established for each method of analysis and sample matrix. The laboratory will review the QC samples to ensure that internal QC data lies within the limits of acceptability. Any suspect trends will be investigated and corrective actions taken.

Due to the heterogeneous nature of site soil, field duplicates cannot be used to assess sampling precision; therefore, soil field duplicates will not be collected for this project.

37.2.2 Accuracy

Accuracy measures the bias of an analytical system by comparing the difference of a measurement with a reference value. The percent recovery of an analyte, which has been added to the environmental samples at a known concentration before extraction and analysis, provides a quantitation tool for analytical accuracy. The spiking solutions used for accuracy determinations are not used for instrument calibrations. The following equation illustrates how accuracy is evaluated:

$$\textit{Accuracy as percent recovery} = \frac{\textit{Spiked Sample Result-Sample Result x 100\%}}{\textit{Spiked Sample True Value}}$$

Percent recoveries for MS, MSD, and LCS that are analyzed for every batch of up to 20 samples serve as a measure of analytical accuracy. Surrogate standards are added to all samples, blanks, MSs, MSDs, and LCSs analyzed for organic contaminants to evaluate the method’s accuracy and to help determine matrix interferences.

The laboratory will use DoD QSM (2017) control limits for accuracy if available. For analytes not specified in the QSM, the laboratory may use statistically based control limits are developed for each method of organic analysis and sample matrix.

Control limits are defined as the mean recovery, plus or minus three standard deviations, of the 20 data points, with the warning limits set as the mean plus or minus two standard deviations. The laboratory will review the QC samples and surrogate standard recoveries for each analysis to ensure that internal QC data lie within the limits of acceptability. The laboratory will investigate any suspect trends and take appropriate corrective actions.

37.2.3 Representativeness

Unlike precision and accuracy, which can be expressed in quantitative terms, representativeness is a qualitative parameter. Representativeness is the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. It is a qualitative parameter that depends on proper design of the sampling program.

Field personnel will be responsible for ensuring that samples are representative of field conditions by collecting and handling samples according to the approved site-specific SAP. Errors in sample collection, packaging, preservation, or COC procedures may result in samples being judged nonrepresentative and may form a basis for rejecting the data.

Data generated by the laboratory must be representative of the laboratory database of accuracy and precision measurements for analytes in different matrices. Laboratory procedures for sample preparation will ensure that aliquots used for analysis are representative of the whole sample. Aliquots to be analyzed for volatile parameters will be removed before the laboratory composites/homogenizes the samples, to avoid losing volatile compounds during mixing.

37.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another, whether it was generated by a single laboratory or during inter-laboratory studies. The use of standardized field and analytical procedures ensures comparability of analytical data.

Sample collection and handling procedures will adhere to EPA-approved protocols. Laboratory procedures will follow standard analytical protocols; use standard units and standardized report formats; follow the calculations as referenced in the approved analytical methods; and use a standard statistical approach for QC measurements.

37.2.5 Completeness

Completeness is a measure of whether all the data necessary to meet the project have been collected. For the data to be considered complete, they must meet all acceptance criteria including accuracy and precision and other criteria specified for an analytical method. The data will be reviewed and/or validated to keep invalid data from being processed through data collection. Completeness is evaluated using the following equation:

$$\textit{Completeness} = \frac{\textit{Acceptable Results x 100\%}}{\textit{Total Results}}$$

The goal for completeness for all QC parameters, except holding times, will be 90 percent. The goal for holding times will be 100 percent. If these goals are not achieved, the sources of nonconformances will be evaluated to determine whether resampling and reanalysis is necessary.

37.3 Sensitivity

Sensitivity is the capability of a method or instrument to measure target analyte responses. Sensitivity determines the minimum concentration or attribute that can be measured by a method (method DL), by an instrument (instrument DL), or by a laboratory (LOD). The laboratory DLC, LOD, or DL will be sensitive enough to meet the project decision limits. Sensitivity may be affected by sample matrix factors such as interference of non-target analytes, sample materials, or sample dilution.

The DLC will be evaluated by the project team prior to sample analysis to determine if the laboratory is able to attain the required sensitivity for the project. The DLC be evaluated after sample analysis to determine if there were any matrix effects, operator errors, or analytical process errors that interfered with the ability to compare the results to the project decision limits. The DLC will be used to determine if no detectable amounts of contaminants of concern are present. If no detectable amounts are reported and all data are acceptable from the verification and validation, then the data is usable. If detectable amounts are reported and the verification and validation are acceptable, then the data is usable. If anomalies in sensitivity are present, the rationale for use or non-use of the affected samples will be discussed in the DQA report.

References

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Aptim Federal Services, LLC, 2017b, *APTIM Management System*.

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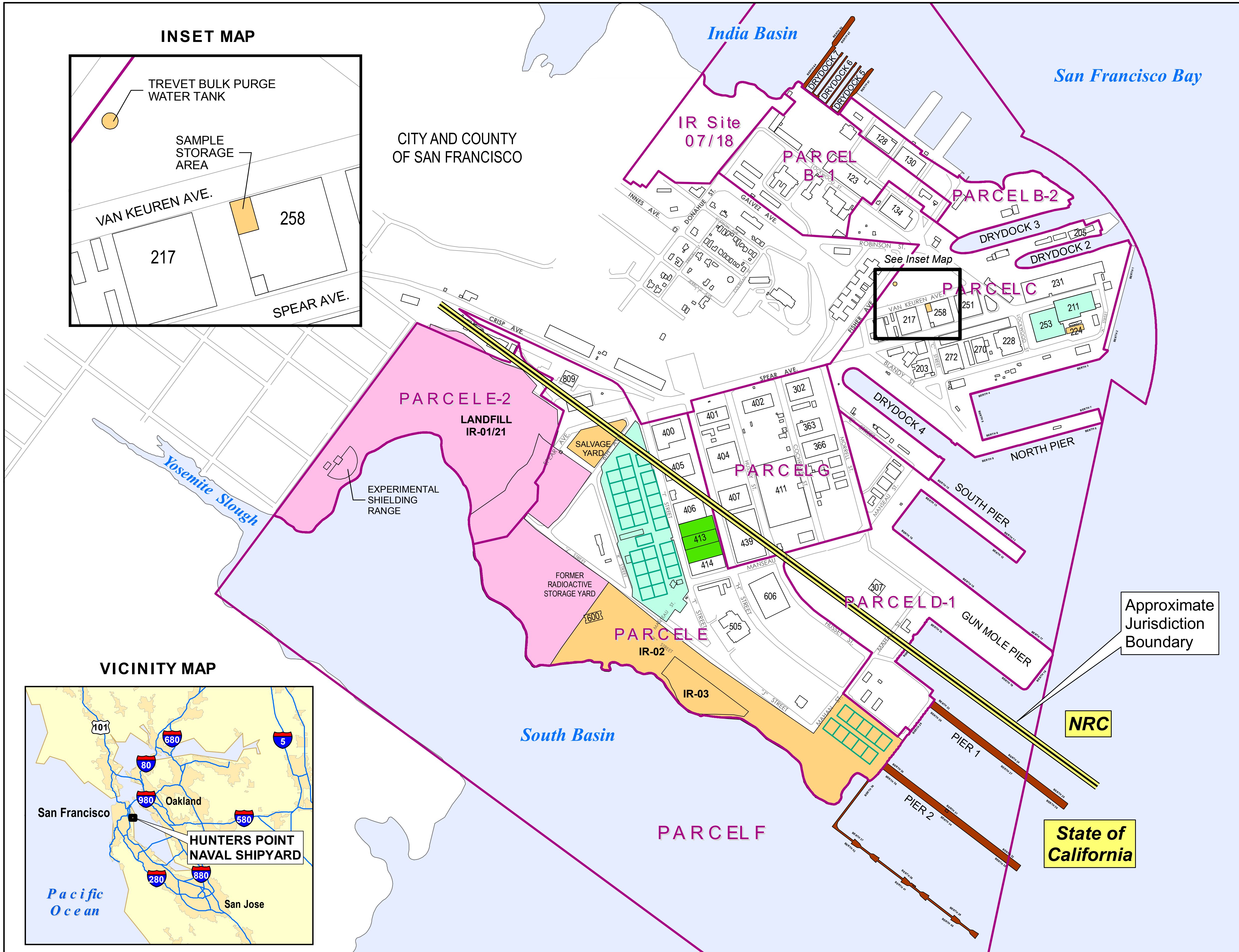
FIGURE



Legend

- Approximate Jurisdiction Boundary
- Parcel Boundary
- Impacted Buildings or Sites - APTIM Basewide Support
- BBES Radiological Waste Bin Storage
- APTIM Parcel E/E2
- Gilbane
- APTIM Piers/Docks
- RSY Pad

0 800 1,600 Feet

APTIM

U.S. Department of the Navy
BRAC PMO West
San Diego, California

FIGURE 1
RADIOLOGICAL AREAS UNDER CONTRACT
(NOVEMBER 1, 2017)

BASEWIDE RADIOLOGICAL SUPPORT
HUNTERS POINT NAVAL SHIPYARD
SAN FRANCISCO, CALIFORNIA

G:\HUNTERS_PT\GIS_Documents\Project_Maps\Basewide\WorkPlan\HP_BW_001_RAD_areas.mxd 9/25/2017

ATTACHMENT 1
FIELD FORMS

CHAIN OF CUSTODY

APTIM

Aptim
Federal Services Division
4005 Port Chicago Hwy
Concord, CA 94520

Ref. Document # ____

Page 1 **of** 1

Project Number: 5001008
Project Name / Location: HPNS Basewide Radiological Support
Purchase Order #:
Project Manager: *Lisa Bercik - 619.446.4508* (Name & phone #)
Shipment Date:
Waybill Number:
Lab Destination:
Lab Contact Name / ph. #:

Send Report To: *Rose Condit*
Phone/Fax Number: *925-288-2037*
Address: *4005 Port Chicago Hwy*
City: *Concord, CA, 94520*

Sampler's Name(s):

Analyses Requested

Sample ID Number	Sample Description	Collection Information: Date	Time	Method	Matrix	# of containers	Preservative (water) / Preservative (soil) / Container Type	Lead (EPA 6010B)	PCBs (EPA8082)	PAHs (EPA 8270-SIM)	Dioxin (EPA 8290)	Gamma Scan (EPA 901.0M)			MS/MSD	Cooler Temperature	Dose Rate µR/Hr
							Preservative (water)										
							Preservative (soil)	N/A	N/A	N/A	N/A	N/A					
							Container Type	4oz Glass Jar	8oz Glass Jar	8oz Glass Jar	8oz Glass Jar	16oz HDPE					

Special Instructions:

☐ 24-hr ☐ 48-hr

Standard TAT ☐ ☐ 3-day ☐ 7-day

Level Of QC Required: I II III Project Specific:

Relinquished By:	Date: / Time:	Received By:	Date: / Time:
Relinquished By:	Date: / Time:	Received By:	Date: / Time:

Method Codes

C = Composite G = Grab

Matrix Codes

DW = Drinking Water SO =Soil
GW = Ground Water SL = Sludge
WW = Waste Water CP = Chip Samples
A = Air ABS=Asbestos, PO=Pipe Openning

APTIM

Aptim Federal Services LLC

DATE			
TIME	:		
PAGE	OF		
PROJECT NO.	**501008**		

SAMPLE COLLECTION LOG

PROJECT NAME **HPNS Basewide Radiological Support**

SAMPLE NO. ______

SAMPLE LOCATION ______

SAMPLE TYPE ☐ Soil ☐ Water ☐ Air ☐ Other (give description)

COMPOSITE ☐ YES ☐ NO

COMPOSITE TYPE ______

DEPTH OF SAMPLE ______

WEATHER ______

MAP ON PAGE ☐

ANALYSES		CONTAINER AND AMOUNT COLLECTED
☐ PCBs	☐ PAHs	☐ 8 - OZ JARS
☐ Metals	☐ Sr90	☐ 4 - OZ JARS
☐ TPH	☐ Dioxin	☐ Encore
☐ Gamma Spec		☐ 16 - OZ JARS

COMMENTS:

PREPARED BY: ______

ATTACHMENT 2
CONTROL LIMITS, CERTIFICATIONS,
ANALYTICAL STANDARD OPERATING PROCEDURES

NOTIFICATION: THIS PAGE CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

FOIA Exemption 4 (5 USC 552(b)(4))
Privileged / confidential trade secrets, commercial, financial information

Pages 134 to 230

YOU MAY APPEAL THIS DECISION

Based on the redaction, this constitutes a partial denial of your request. Because your request has been denied in part, you are advised of your right to appeal this determination in writing.

Please refer to the accompanying correspondence from the FOIA Office for directions and information about the appeal process.

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

TestAmerica St. Louis

13715 Rider Trail North

Earth City, MO 63045

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2886**

Expiration Date: **3/31/2018**

Effective Date: **4/1/2016**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA Water Boards

STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

TestAmerica St. Louis

13715 Rider Trail North
Earth City, MO 63045
Phone: (314) 298-8566

Certificate No. 2886
Expiration Date 3/31/2018

Field of Testing: 106 - Radiochemistry of Drinking Water

106.010	001	Gross Alpha and Beta Radiation	EPA 900.0
106.010	002	Gross Beta	EPA 900.0
106.030	003	Gamma Emitters	EPA 901.1
106.050	002	Radium-226 (estimate)	EPA 903.0
106.060	001	Radium-228	EPA 904.0
106.070	003	Strontium-90	EPA 905.0
106.080	001	Tritium	EPA 906.0
106.220	001	Strontium-89, 90	DOE Sr-02

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.020	001	Conductivity	EPA 120.1
108.112	001	Boron	EPA 200.7
108.112	002	Calcium	EPA 200.7
108.112	004	Magnesium	EPA 200.7
108.112	005	Potassium	EPA 200.7
108.112	007	Sodium	EPA 200.7
108.113	003	Magnesium	EPA 200.8
108.120	001	Bromide	EPA 300.0
108.120	002	Chloride	EPA 300.0
108.120	003	Fluoride	EPA 300.0
108.120	012	Nitrate (as N)	EPA 300.0
108.120	014	Nitrite (as N)	EPA 300.0
108.120	015	Phosphate, Ortho (as P)	EPA 300.0
108.183	001	Cyanide, Total	EPA 335.4
108.211	002	Kjeldahl Nitrogen, Total (as N)	EPA 351.2
108.323	001	Chemical Oxygen Demand	EPA 410.4
108.381	001	Oil and Grease	EPA 1664A
108.440	001	Residue, Total	SM2540B-1997
108.441	001	Residue, Filterable TDS	SM2540C-1997
108.442	001	Residue, Non-filterable TSS	SM2540D-1997
108.490	001	Hydrogen Ion (pH)	SM4500-H+ B-2000

Field of Testing: 109 - Toxic Chemical Elements of Wastewater

109.010	001	Aluminum	EPA 200.7
109.010	002	Antimony	EPA 200.7
109.010	003	Arsenic	EPA 200.7
109.010	004	Barium	EPA 200.7
109.010	005	Beryllium	EPA 200.7
109.010	006	Boron	EPA 200.7

109.010	007	Cadmium	EPA 200.7
109.010	009	Chromium	EPA 200.7
109.010	010	Cobalt	EPA 200.7
109.010	011	Copper	EPA 200.7
109.010	012	Iron	EPA 200.7
109.010	013	Lead	EPA 200.7
109.010	015	Manganese	EPA 200.7
109.010	016	Molybdenum	EPA 200.7
109.010	017	Nickel	EPA 200.7
109.010	019	Selenium	EPA 200.7
109.010	021	Silver	EPA 200.7
109.010	023	Thallium	EPA 200.7
109.010	024	Tin	EPA 200.7
109.010	025	Titanium	EPA 200.7
109.010	026	Vanadium	EPA 200.7
109.010	027	Zinc	EPA 200.7
109.020	001	Aluminum	EPA 200.8
109.020	002	Antimony	EPA 200.8
109.020	003	Arsenic	EPA 200.8
109.020	004	Barium	EPA 200.8
109.020	005	Beryllium	EPA 200.8
109.020	006	Cadmium	EPA 200.8
109.020	007	Chromium	EPA 200.8
109.020	008	Cobalt	EPA 200.8
109.020	009	Copper	EPA 200.8
109.020	010	Lead	EPA 200.8
109.020	011	Manganese	EPA 200.8
109.020	012	Molybdenum	EPA 200.8
109.020	013	Nickel	EPA 200.8
109.020	014	Selenium	EPA 200.8
109.020	015	Silver	EPA 200.8
109.020	016	Thallium	EPA 200.8
109.020	017	Vanadium	EPA 200.8
109.020	018	Zinc	EPA 200.8
109.190	001	Mercury	EPA 245.1

Field of Testing: 110 - Volatile Organic Chemistry of Wastewater

110.040	000	Purgeable Organic Compounds	EPA 624

Field of Testing: 111 - Semi-volatile Organic Chemistry of Wastewater

111.100	000	Base/Neutral & Acid Organics	EPA 625
111.170	000	Organochlorine Pesticides and PCBs	EPA 608

Field of Testing: 112 - Radiochemistry of Wastewater

112.010	001	Gross Alpha and Beta Radiation	EPA 900.0
112.010	002	Gross Beta	EPA 900.0
112.020	001	Total Alpha Radium	EPA 903.0
112.140	002	Gamma	EPA 901.1
112.160	001	Radium-228	EPA 904.0

112.170	001	Strontium	EPA 905.0
112.180	001	Tritium	EPA 906.0
112.510	001	Strontium	DOE Sr-02

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010B
114.010	002	Arsenic	EPA 6010B
114.010	003	Barium	EPA 6010B
114.010	004	Beryllium	EPA 6010B
114.010	005	Cadmium	EPA 6010B
114.010	006	Chromium	EPA 6010B
114.010	007	Cobalt	EPA 6010B
114.010	008	Copper	EPA 6010B
114.010	009	Lead	EPA 6010B
114.010	010	Molybdenum	EPA 6010B
114.010	011	Nickel	EPA 6010B
114.010	012	Selenium	EPA 6010B
114.010	013	Silver	EPA 6010B
114.010	014	Thallium	EPA 6010B
114.010	015	Vanadium	EPA 6010B
114.010	016	Zinc	EPA 6010B
114.020	001	Antimony	EPA 6020
114.020	002	Arsenic	EPA 6020
114.020	003	Barium	EPA 6020
114.020	004	Beryllium	EPA 6020
114.020	005	Cadmium	EPA 6020
114.020	006	Chromium	EPA 6020
114.020	007	Cobalt	EPA 6020
114.020	008	Copper	EPA 6020
114.020	009	Lead	EPA 6020
114.020	010	Molybdenum	EPA 6020
114.020	011	Nickel	EPA 6020
114.020	012	Selenium	EPA 6020
114.020	013	Silver	EPA 6020
114.020	014	Thallium	EPA 6020
114.020	015	Vanadium	EPA 6020
114.020	016	Zinc	EPA 6020
114.103	001	Chromium (VI)	EPA 7196A
114.141	001	Mercury	EPA 7471A
114.221	001	Cyanide, Total	EPA 9012A
114.241	001	Corrosivity - pH Determination	EPA 9045C
114.250	001	Fluoride	EPA 9056

Field of Testing: 115 - Extraction Test of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311
115.021	001	TCLP Inorganics	EPA 1311
115.022	001	TCLP Extractables	EPA 1311
115.023	001	TCLP Volatiles	EPA 1311

115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312

Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste

116.030	001	Gasoline-range Organics	EPA 8015B
116.080	000	Volatile Organic Compounds	EPA 8260B

Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel-range Total Petroleum Hydrocarbons	EPA 8015B
117.110	000	Extractable Organics	EPA 8270C
117.170	000	Nitroaromatics and Nitramines	EPA 8330
117.210	000	Organochlorine Pesticides	EPA 8081A
117.220	000	PCBs	EPA 8082
117.250	000	Chlorinated Herbicides	EPA 8151A

Field of Testing: 118 - Radiochemistry of Hazardous Waste

118.010	001	Gross Alpha and Beta In Hazardous Wastes	EPA 9310
118.010	002	Gross Beta	EPA 9310
118.020	001	Radium, Total	EPA 9315
118.030	001	Radium-228	EPA 9320
118.271	001	Strontium	DOE Sr-02

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010
120.040	001	Reactive Cyanide	Section 7.3 SW-846
120.050	001	Reactive Sulfide	Section 7.3 SW-846
120.070	001	Corrosivity - pH Determination	EPA 9040B
120.080	001	Corrosivity - pH Determination	EPA 9045C

LABORATORY ACCREDITATION BUREAU a division of A-S-B

Certificate of Accreditation

ISO/IEC 17025:2005 Certificate Number L2305

TestAmerica Laboratories

St. Louis Facility
13715 Rider Trail North
Earth City Missouri 63045

has met the requirements set forth in L-A-B's policies and procedures, all requirements of ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories" and the U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).*

The accredited lab has demonstrated technical competence to a defined "Scope of Accreditation" and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Accreditation valid through: April 6, 2019

R. Douglas Leonard, Jr., President, COO
Laboratory Accreditation Bureau
Presented the 6th of April 2016

*See the laboratory's Scope of Accreditation for details of accredited parameters
**Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).
Form 403.14 – Rev 1 7/3/13

LABORATORY ACCREDITATION BUREAU

Certificate # L2305

Scope of Accreditation
For
TestAmerica Laboratories

St. Louis Facility
13715 Rider Trail North
Earth City, Missouri 63045
Tony Byrd
314-298-8566

In recognition of a successful assessment to ISO/IEC 17025:2005 and the requirements of the DoD Environmental Laboratory Accreditation Program (LABPR 403 DoD ELAP) as detailed in the DoD Quality Systems Manual for Environmental Laboratories (DoD QSM V5) based on the TNI Standard - Environmental Laboratory Sector, Volume 1 – Management and Technical Requirements for Laboratories Performing Environmental Analysis, Sept 2009 (EL-V1-2009); accreditation is granted to **TestAmerica Laboratories** to perform the following tests:

Accreditation granted through: **April 6, 2019**

Testing - Environmental

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010C	Aluminum
ICP-AES	EPA 6010C	Antimony
ICP-AES	EPA 6010C	Arsenic
ICP-AES	EPA 6010C	Barium
ICP-AES	EPA 6010C	Beryllium
ICP-AES	EPA 6010C	Bismuth
ICP-AES	EPA 6010C	Boron
ICP-AES	EPA 6010C	Cadmium
ICP-AES	EPA 6010C	Calcium
ICP-AES	EPA 6010C	Chromium
ICP-AES	EPA 6010C	Cobalt
ICP-AES	EPA 6010C	Copper
ICP-AES	EPA 6010C	Iron
ICP-AES	EPA 6010C	Lead
ICP-AES	EPA 6010C	Lithium
ICP-AES	EPA 6010C	Magnesium

LABORATORY ACCREDITATION BUREAU

Certificate # L2305

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010C	Manganese
ICP-AES	EPA 6010C	Molybdenum
ICP-AES	EPA 6010C	Nickel
ICP-AES	EPA 6010C	Phosphorus
ICP-AES	EPA 6010C	Potassium
ICP-AES	EPA 6010C	Selenium
ICP-AES	EPA 6010C	Silicon
ICP-AES	EPA 6010C	Silver
ICP-AES	EPA 6010C	Sodium
ICP-AES	EPA 6010C	Strontium
ICP-AES	EPA 6010C	Sulfur
ICP-AES	EPA 6010C	Thallium
ICP-AES	EPA 6010C	Thorium
ICP-AES	EPA 6010C	Tin
ICP-AES	EPA 6010C	Titanium
ICP-AES	EPA 6010C	Uranium
ICP-AES	EPA 6010C	Vanadium
ICP-AES	EPA 6010C	Zinc
GC/MS	EPA 8260C	Acetone
GC/MS	EPA 8260C	Acetonitrile
GC/MS	EPA 8260C	Acrolein
GC/MS	EPA 8260C	Acrylonitrile
GC/MS	EPA 8260C	Benzene
GC/MS	EPA 8260C	Benzyl chloride
GC/MS	EPA 8260C	Bromobenzene
GC/MS	EPA 8260C	Bromochloromethane
GC/MS	EPA 8260C	Bromodichloromethane
GC/MS	EPA 8260C	Bromoform
GC/MS	EPA 8260C	Bromomethane
GC/MS	EPA 8260C	n-Butanol
GC/MS	EPA 8260C	2-Butanone
GC/MS	EPA 8260C	n-Butylbenzene
GC/MS	EPA 8260C	sec-Butylbenzene
GC/MS	EPA 8260C	tert-Butylbenzene
GC/MS	EPA 8260C	Carbon disulfide

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260C	Carbon tetrachloride
GC/MS	EPA 8260C	Chlorobenzene
GC/MS	EPA 8260C	Chlorobromomethane
GC/MS	EPA 8260C	2-Chloro-1,3-butadiene
GC/MS	EPA 8260C	Chlorodibromomethane
GC/MS	EPA 8260C	Dibromochloromethane
GC/MS	EPA 8260C	Chloroethane
GC/MS	EPA 8260C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260C	Chloroform
GC/MS	EPA 8260C	Chloromethane
GC/MS	EPA 8260C	Allyl chloride
GC/MS	EPA 8260C	2-Chlorotoluene
GC/MS	EPA 8260C	4-Chlorotoluene
GC/MS	EPA 8260C	Cyclohexane
GC/MS	EPA 8260C	Cyclohexanone
GC/MS	EPA 8260C	1,2-Dibromo-3-chloropropane
GC/MS	EPA 8260C	1,2-Dibromoethane
GC/MS	EPA 8260C	Dibromomethane
GC/MS	EPA 8260C	1,2-Dichlorobenzene
GC/MS	EPA 8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260C	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260C	Dichlorodifluoromethane
GC/MS	EPA 8260C	1,1-Dichloroethane
GC/MS	EPA 8260C	1,2-Dichloroethane
GC/MS	EPA 8260C	cis-1,2-Dichloroethene
GC/MS	EPA 8260C	trans-1,2-Dichloroethene
GC/MS	EPA 8260C	1,1-Dichloroethene
GC/MS	EPA 8260C	1,2-Dichloroethene (total)
GC/MS	EPA 8260C	1,2-Dichloropropane
GC/MS	EPA 8260C	1,3-Dichloropropane
GC/MS	EPA 8260C	2,2-Dichloropropane
GC/MS	EPA 8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260C	trans-1,3-Dichloropropene
GC/MS	EPA 8260C	1,1-Dichloropropene

LABORATORY ACCREDITATION BUREAU

Certificate # L2305

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260C	1,2-Dichloro-1,1,2,2-tetrafluoroethane
GC/MS	EPA 8260C	Dimethyl disulfide
GC/MS	EPA 8260C	1,4-Dioxane
GC/MS	EPA 8260C	Ethyl acetate
GC/MS	EPA 8260C	Ethylbenzene
GC/MS	EPA 8260C	Ethyl ether
GC/MS	EPA 8260C	Diethyl ether
GC/MS	EPA 8260C	Ethyl methacrylate
GC/MS	EPA 8260C	Freon 113
GC/MS	EPA 8260C	Hexachlorobutadiene
GC/MS	EPA 8260C	n-Hexane
GC/MS	EPA 8260C	2-Hexanone
GC/MS	EPA 8260C	Iodomethane
GC/MS	EPA 8260C	Isobutanol
GC/MS	EPA 8260C	Isopropylbenzene
GC/MS	EPA 8260C	p-Isopropyltoluene
GC/MS	EPA 8260C	Methacrylonitrile
GC/MS	EPA 8260C	Methyl acetate
GC/MS	EPA 8260C	Methyl butyl ketone
GC/MS	EPA 8260C	Methylcyclohexane
GC/MS	EPA 8260C	Dichloromethane
GC/MS	EPA 8260C	Methylene chloride
GC/MS	EPA 8260C	Methyl methacrylate
GC/MS	EPA 8260C	4-Methyl-2-pentanone
GC/MS	EPA 8260C	MTBE
GC/MS	EPA 8260C	Naphthalene
GC/MS	EPA 8260C	2-Nitropropane
GC/MS	EPA 8260C	Nonanal
GC/MS	EPA 8260C	Pentachloroethane
GC/MS	EPA 8260C	Propionitrile
GC/MS	EPA 8260C	n-Propylbenzene
GC/MS	EPA 8260C	Styrene
GC/MS	EPA 8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260C	Tetrachloroethene

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260C	Tetrahydrofuran
GC/MS	EPA 8260C	Toluene
GC/MS	EPA 8260C	1,3,5-Trichlorobenzene
GC/MS	EPA 8260C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260C	Trichloroethene
GC/MS	EPA 8260C	Trichlorofluoromethane
GC/MS	EPA 8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260C	Trichlorotrifluoroethane
GC/MS	EPA 8260C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260C	Vinyl acetate
GC/MS	EPA 8260C	Vinyl chloride
GC/MS	EPA 8260C	m-Xylene & p-Xylene
GC/MS	EPA 8260C	o-Xylene
GC/MS	EPA 8260C	Xylenes (total)
GC/MS	EPA 8260C SIM	1,4-Dioxane
GC/MS	EPA 624	Acetone
GC/MS	EPA 624	Acetonitrile
GC/MS	EPA 624	Acrolein
GC/MS	EPA 624	Acrylonitrile
GC/MS	EPA 624	Benzene
GC/MS	EPA 624	Benzyl chloride
GC/MS	EPA 624	Bromobenzene
GC/MS	EPA 624	Bromochloromethane
GC/MS	EPA 624	Bromodichloromethane
GC/MS	EPA 624	Bromoform
GC/MS	EPA 624	Bromomethane
GC/MS	EPA 624	n-Butanol
GC/MS	EPA 624	2-Butanone
GC/MS	EPA 624	n-Butylbenzene
GC/MS	EPA 624	sec-Butylbenzene

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Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 624	tert-Butylbenzene
GC/MS	EPA 624	Carbon disulfide
GC/MS	EPA 624	Carbon tetrachloride
GC/MS	EPA 624	Chlorobenzene
GC/MS	EPA 624	Chlorobromomethane
GC/MS	EPA 624	2-Chloro-1,3-butadiene
GC/MS	EPA 624	Chlorodibromomethane
GC/MS	EPA 624	Dibromochloromethane
GC/MS	EPA 624	Chloroethane
GC/MS	EPA 624	2-Chloroethyl vinyl ether
GC/MS	EPA 624	Chloroform
GC/MS	EPA 624	Chloromethane
GC/MS	EPA 624	Allyl chloride
GC/MS	EPA 624	2-Chlorotoluene
GC/MS	EPA 624	4-Chlorotoluene
GC/MS	EPA 624	Cyclohexane
GC/MS	EPA 624	Cyclohexanone
GC/MS	EPA 624	1,2-Dibromo-3-chloropropane
GC/MS	EPA 624	1,2-Dibromoethane
GC/MS	EPA 624	Dibromomethane
GC/MS	EPA 624	1,2-Dichlorobenzene
GC/MS	EPA 624	1,3-Dichlorobenzene
GC/MS	EPA 624	1,4-Dichlorobenzene
GC/MS	EPA 624	trans-1,4-Dichloro-2-butene
GC/MS	EPA 624	Dichlorodifluoromethane
GC/MS	EPA 624	1,1-Dichloroethane
GC/MS	EPA 624	1,2-Dichloroethane
GC/MS	EPA 624	cis-1,2-Dichloroethene
GC/MS	EPA 624	trans-1,2-Dichloroethene
GC/MS	EPA 624	1,1-Dichloroethene
GC/MS	EPA 624	1,2-Dichloroethene (total)
GC/MS	EPA 624	1,2-Dichloropropane
GC/MS	EPA 624	1,3-Dichloropropane
GC/MS	EPA 624	2,2-Dichloropropane
GC/MS	EPA 624	cis-1,3-Dichloropropene

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 624	trans-1,3-Dichloropropene
GC/MS	EPA 624	1,1-Dichloropropene
GC/MS	EPA 624	1,2-Dichloro-1,1,2,2-tetrafluoroethane
GC/MS	EPA 624	Dimethyl disulfide
GC/MS	EPA 624	1,4-Dioxane
GC/MS	EPA 624	Ethyl acetate
GC/MS	EPA 624	Ethylbenzene
GC/MS	EPA 624	Ethyl ether
GC/MS	EPA 624	Diethyl ether
GC/MS	EPA 624	Ethyl methacrylate
GC/MS	EPA 624	Freon 113
GC/MS	EPA 624	Hexachlorobutadiene
GC/MS	EPA 624	n-Hexane
GC/MS	EPA 624	2-Hexanone
GC/MS	EPA 624	Iodomethane
GC/MS	EPA 624	Isobutanol
GC/MS	EPA 624	Isopropylbenzene
GC/MS	EPA 624	p-Isopropyltoluene
GC/MS	EPA 624	Methacrylonitrile
GC/MS	EPA 624	Methyl acetate
GC/MS	EPA 624	Methyl butyl ketone
GC/MS	EPA 624	Methylcyclohexane
GC/MS	EPA 624	Dichloromethane
GC/MS	EPA 624	Methylene chloride
GC/MS	EPA 624	Methyl methacrylate
GC/MS	EPA 624	4-Methyl-2-pentanone
GC/MS	EPA 624	MTBE
GC/MS	EPA 624	Naphthalene
GC/MS	EPA 624	2-Nitropropane
GC/MS	EPA 624	Nonanal
GC/MS	EPA 624	Pentachloroethane
GC/MS	EPA 624	Propionitrile
GC/MS	EPA 624	n-Propylbenzene
GC/MS	EPA 624	Styrene
GC/MS	EPA 624	1,1,1,2-Tetrachloroethane

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 624	1,1,2,2-Tetrachloroethane
GC/MS	EPA 624	Tetrachloroethene
GC/MS	EPA 624	Tetrahydrofuran
GC/MS	EPA 624	Toluene
GC/MS	EPA 624	1,3,5-Trichlorobenzene
GC/MS	EPA 624	1,2,3-Trichlorobenzene
GC/MS	EPA 624	1,2,4-Trichlorobenzene
GC/MS	EPA 624	1,1,1-Trichloroethane
GC/MS	EPA 624	1,1,2-Trichloroethane
GC/MS	EPA 624	Trichloroethene
GC/MS	EPA 624	Trichlorofluoromethane
GC/MS	EPA 624	1,2,3-Trichloropropane
GC/MS	EPA 624	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 624	Trichlorotrifluoroethane
GC/MS	EPA 624	1,2,4-Trimethylbenzene
GC/MS	EPA 624	1,3,5-Trimethylbenzene
GC/MS	EPA 624	Vinyl acetate
GC/MS	EPA 624	Vinyl chloride
GC/MS	EPA 624	m-Xylene & p-Xylene
GC/MS	EPA 624	o-Xylene
GC/MS	EPA 624	Xylenes (total)
GC/MS	EPA 8270D	Acenaphthene
GC/MS	EPA 8270D	Acenaphthylene
GC/MS	EPA 8270D	Acetophenone
GC/MS	EPA 8270D	2-Acetylaminofluorene
GC/MS	EPA 8270D	4-Aminobiphenyl
GC/MS	EPA 8270D	Aniline
GC/MS	EPA 8270D	Anthracene
GC/MS	EPA 8270D	Aramite (total)
GC/MS	EPA 8270D	Atrazine
GC/MS	EPA 8270D	Azobenzene
GC/MS	EPA 8270D	Benzaldehyde
GC/MS	EPA 8270D	Benzidine
GC/MS	EPA 8270D	Benzo(a)anthracene
GC/MS	EPA 8270D	Benzo(b)fluoranthene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270D	Benzo(k)fluoranthene
GC/MS	EPA 8270D	Benzoic acid
GC/MS	EPA 8270D	Benzo(ghi)perylene
GC/MS	EPA 8270D	Benzo(a)pyrene
GC/MS	EPA 8270D	Benzyl alcohol
GC/MS	EPA 8270D	1,1'-Biphenyl
GC/MS	EPA 8270D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270D	bis(2-Chloroethyl) ether
GC/MS	EPA 8270D	bis(2-Chloroisopropyl) ether
GC/MS	EPA 8270D	bis(2-Ethylhexyl) phthalate
GC/MS	EPA 8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270D	n-Butylbenzenesulfonamide
GC/MS	EPA 8270D	Butyl benzyl phthalate
GC/MS	EPA 8270D	Caprolactam
GC/MS	EPA 8270D	Carbazole
GC/MS	EPA 8270D	4-Chloroaniline
GC/MS	EPA 8270D	Chlorobenzilate
GC/MS	EPA 8270D	p-Chlorobenzilate
GC/MS	EPA 8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270D	2-Chloronaphthalene
GC/MS	EPA 8270D	2-Chlorophenol
GC/MS	EPA 8270D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270D	Chrysene
GC/MS	EPA 8270D	Cresols (total)
GC/MS	EPA 8270D	Cyclohexanol
GC/MS	EPA 8270D	Diallate
GC/MS	EPA 8270D	Dibenz(a,h)anthracene
GC/MS	EPA 8270D	Dibenzo(a,h)anthracene
GC/MS	EPA 8270D	Dibenzofuran
GC/MS	EPA 8270D	Di-n-butyl phthalate
GC/MS	EPA 8270D	1,2-Dichlorobenzene
GC/MS	EPA 8270D	1,3-Dichlorobenzene
GC/MS	EPA 8270D	1,4-Dichlorobenzene
GC/MS	EPA 8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270D	2,4-Dichlorophenol
GC/MS	EPA 8270D	2,6-Dichlorophenol

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8270D	Diethyl phthalate
GC/MS	EPA 8270D	O,O-Diethyl-O-(2-pyrazinyl) phosphorothioate
GC/MS	EPA 8270D	Dimethoate
GC/MS	EPA 8270D	p-Dimethylaminoazobenzene
GC/MS	EPA 8270D	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270D	3,3'-Dimethylbenzidine
GC/MS	EPA 8270D	Dimethylformamide
GC/MS	EPA 8270D	alpha,alpha-Dimethylphenethylamine
GC/MS	EPA 8270D	2,4-Dimethylphenol
GC/MS	EPA 8270D	Dimethyl phthalate
GC/MS	EPA 8270D	1,3-Dinitrobenzene
GC/MS	EPA 8270D	1,4-Dinitrobenzene
GC/MS	EPA 8270D	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270D	2,4-Dinitrophenol
GC/MS	EPA 8270D	2,4-Dinitrotoluene
GC/MS	EPA 8270D	2,6-Dinitrotoluene
GC/MS	EPA 8270D	2-sec-Butyl-4,6-dinitrophenol
GC/MS	EPA 8270D	Dinoseb
GC/MS	EPA 8270D	Di-n-octyl phthalate
GC/MS	EPA 8270D	1,4-Dioxane
GC/MS	EPA 8270D	1,2-Diphenylhydrazine (as Azobenzene)
GC/MS	EPA 8270D	Disulfoton
GC/MS	EPA 8270D	Ethyl methacrylate
GC/MS	EPA 8270D	Ethyl methanesulfonate
GC/MS	EPA 8270D	Famphur
GC/MS	EPA 8270D	Fluoranthene
GC/MS	EPA 8270D	Fluorene
GC/MS	EPA 8270D	Hexachlorobenzene
GC/MS	EPA 8270D	Hexachlorobutadiene
GC/MS	EPA 8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270D	Hexachloro-1,3-cyclopentadiene
GC/MS	EPA 8270D	Hexachloroethane
GC/MS	EPA 8270D	Hexachlorophene
GC/MS	EPA 8270D	Hexachloropropene
GC/MS	EPA 8270D	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270D	Isodrin

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8270D	Isophorone
GC/MS	EPA 8270D	Isosafrole
GC/MS	EPA 8270D	Kepone
GC/MS	EPA 8270D	Methapyrilene
GC/MS	EPA 8270D	2-Methylbenzenamine
GC/MS	EPA 8270D	3-Methylcholanthrene
GC/MS	EPA 8270D	4,4'-Methylenebis(2-chloroaniline)
GC/MS	EPA 8270D	Methyl methacrylate
GC/MS	EPA 8270D	Methyl methanesulfonate
GC/MS	EPA 8270D	2-Methylnaphthalene
GC/MS	EPA 8270D	Methyl parathion
GC/MS	EPA 8270D	2-Methylphenol
GC/MS	EPA 8270D	3-Methylphenol & 4-Methylphenol
GC/MS	EPA 8270D	2-Methylphenol, 3-methylphenol and 4-methylphenol
GC/MS	EPA 8270D	Methylphenols (total)
GC/MS	EPA 8270D	Naphthalene
GC/MS	EPA 8270D	1,4-Naphthoquinone
GC/MS	EPA 8270D	1-Naphthylamine
GC/MS	EPA 8270D	2-Naphthylamine
GC/MS	EPA 8270D	2-Nitroaniline
GC/MS	EPA 8270D	3-Nitroaniline
GC/MS	EPA 8270D	4-Nitroaniline
GC/MS	EPA 8270D	Nitrobenzene
GC/MS	EPA 8270D	2-Nitrophenol
GC/MS	EPA 8270D	4-Nitrophenol
GC/MS	EPA 8270D	4-Nitroquinoline-1-oxide
GC/MS	EPA 8270D	N-Nitrosodi-n-butylamine
GC/MS	EPA 8270D	N-Nitrosodiethylamine
GC/MS	EPA 8270D	N-Nitrosodimethylamine
GC/MS	EPA 8270D	N-Nitrosodiphenylamine
GC/MS	EPA 8270D	N-Nitrosodi-n-propylamine
GC/MS	EPA 8270D	N-Nitrosomethylethylamine
GC/MS	EPA 8270D	N-Nitrosomorpholine
GC/MS	EPA 8270D	N-Nitrosopiperidine
GC/MS	EPA 8270D	N-Nitrosopyrrolidine
GC/MS	EPA 8270D	5-Nitro-o-toluidine

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8270D	2,2'-oxybis(1-Chloropropane)
GC/MS	EPA 8270D	Parathion
GC/MS	EPA 8270D	Pentachlorobenzene
GC/MS	EPA 8270D	Pentachloroethane
GC/MS	EPA 8270D	Pentachloronitrobenzene
GC/MS	EPA 8270D	Pentachlorophenol
GC/MS	EPA 8270D	Phenacetin
GC/MS	EPA 8270D	Phenanthrene
GC/MS	EPA 8270D	Phenol
GC/MS	EPA 8270D	p-Phenylene diamine
GC/MS	EPA 8270D	Phorate
GC/MS	EPA 8270D	2-Picoline
GC/MS	EPA 8270D	Pronamide
GC/MS	EPA 8270D	Pyrene
GC/MS	EPA 8270D	Pyridine
GC/MS	EPA 8270D	Safrole
GC/MS	EPA 8270D	Sulfotepp
GC/MS	EPA 8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270D	Tetraethyldithiopyrophosphate (Sulfotepp)
GC/MS	EPA 8270D	Thionazin
GC/MS	EPA 8270D	o-Toluidine
GC/MS	EPA 8270D	Tributyl phosphate
GC/MS	EPA 8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270D	O,O,O-Triethyl phosphorothioate
GC/MS	EPA 8270D	1,3,5-Trinitrobenzene
GC/MS	EPA 8270D	Tris(2-chloroethyl)phosphate
GC/MS	EPA 8270D	1-Methyl naphthalene
GC/MS	EPA 625	Acenaphthene
GC/MS	EPA 625	Acenaphthylene
GC/MS	EPA 625	Acetophenone
GC/MS	EPA 625	2-Acetylaminofluorene
GC/MS	EPA 625	4-Aminobiphenyl
GC/MS	EPA 625	Aniline

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 625	Anthracene
GC/MS	EPA 625	Aramite (total)
GC/MS	EPA 625	Atrazine
GC/MS	EPA 625	Azobenzene
GC/MS	EPA 625	Benzaldehyde
GC/MS	EPA 625	Benzidine
GC/MS	EPA 625	Benzo(a)anthracene
GC/MS	EPA 625	Benzo(b)fluoranthene
GC/MS	EPA 625	Benzo(k)fluoranthene
GC/MS	EPA 625	Benzoic acid
GC/MS	EPA 625	Benzo(ghi)perylene
GC/MS	EPA 625	Benzo(a)pyrene
GC/MS	EPA 625	Benzyl alcohol
GC/MS	EPA 625	1,1'-Biphenyl
GC/MS	EPA 625	bis(2-Chloroethoxy)methane
GC/MS	EPA 625	bis(2-Chloroethyl) ether
GC/MS	EPA 625	bis(2-Chloroisopropyl) ether
GC/MS	EPA 625	bis(2-Ethylhexyl) phthalate
GC/MS	EPA 625	4-Bromophenyl phenyl ether
GC/MS	EPA 625	n-Butylbenzenesulfonamide
GC/MS	EPA 625	Butyl benzyl phthalate
GC/MS	EPA 625	Caprolactam
GC/MS	EPA 625	Carbazole
GC/MS	EPA 625	4-Chloroaniline
GC/MS	EPA 625	Chlorobenzilate
GC/MS	EPA 625	p-Chlorobenzilate
GC/MS	EPA 625	4-Chloro-3-methylphenol
GC/MS	EPA 625	2-Chloronaphthalene
GC/MS	EPA 625	2-Chlorophenol
GC/MS	EPA 625	4-Chlorophenyl phenyl ether
GC/MS	EPA 625	Chrysene
GC/MS	EPA 625	Cresols (total)
GC/MS	EPA 625	Cyclohexanol
GC/MS	EPA 625	Diallate
GC/MS	EPA 625	Dibenz(a,h)anthracene
GC/MS	EPA 625	Dibenzo(a,h)anthracene
GC/MS	EPA 625	Dibenzofuran
GC/MS	EPA 625	Di-n-butyl phthalate

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 625	1,2-Dichlorobenzene
GC/MS	EPA 625	1,3-Dichlorobenzene
GC/MS	EPA 625	1,4-Dichlorobenzene
GC/MS	EPA 625	3,3'-Dichlorobenzidine
GC/MS	EPA 625	2,4-Dichlorophenol
GC/MS	EPA 625	2,6-Dichlorophenol
GC/MS	EPA 625	Diethyl phthalate
GC/MS	EPA 625	O,O-Diethyl-O-(2-pyrazinyl) phosphorothioate
GC/MS	EPA 625	Dimethoate
GC/MS	EPA 625	p-Dimethylaminoazobenzene
GC/MS	EPA 625	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 625	3,3'-Dimethylbenzidine
GC/MS	EPA 625	Dimethylformamide
GC/MS	EPA 625	alpha,alpha-Dimethylphenethylamine
GC/MS	EPA 625	2,4-Dimethylphenol
GC/MS	EPA 625	Dimethyl phthalate
GC/MS	EPA 625	1,3-Dinitrobenzene
GC/MS	EPA 625	1,4-Dinitrobenzene
GC/MS	EPA 625	4,6-Dinitro-2-methylphenol
GC/MS	EPA 625	2,4-Dinitrophenol
GC/MS	EPA 625	2,4-Dinitrotoluene
GC/MS	EPA 625	2,6-Dinitrotoluene
GC/MS	EPA 625	2-sec-Butyl-4,6-dinitrophenol
GC/MS	EPA 625	Dinoseb
GC/MS	EPA 625	Di-n-octyl phthalate
GC/MS	EPA 625	1,4-Dioxane
GC/MS	EPA 625	1,2-Diphenylhydrazine (as Azobenzene)
GC/MS	EPA 625	Disulfoton
GC/MS	EPA 625	Ethyl methacrylate
GC/MS	EPA 625	Ethyl methanesulfonate
GC/MS	EPA 625	Famphur
GC/MS	EPA 625	Fluoranthene
GC/MS	EPA 625	Fluorene
GC/MS	EPA 625	Hexachlorobenzene
GC/MS	EPA 625	Hexachlorobutadiene
GC/MS	EPA 625	Hexachlorocyclopentadiene
GC/MS	EPA 625	Hexachloro-1,3-cyclopentadiene
GC/MS	EPA 625	Hexachloroethane

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 625	Hexachlorophene
GC/MS	EPA 625	Hexachloropropene
GC/MS	EPA 625	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 625	Isodrin
GC/MS	EPA 625	Isophorone
GC/MS	EPA 625	Isosafrole
GC/MS	EPA 625	Kepone
GC/MS	EPA 625	Methapyrilene
GC/MS	EPA 625	2-Methylbenzenamine
GC/MS	EPA 625	3-Methylcholanthrene
GC/MS	EPA 625	4,4'-Methylenebis(2-chloroaniline)
GC/MS	EPA 625	Methyl methacrylate
GC/MS	EPA 625	Methyl methanesulfonate
GC/MS	EPA 625	2-Methylnaphthalene
GC/MS	EPA 625	Methyl parathion
GC/MS	EPA 625	2-Methylphenol
GC/MS	EPA 625	3-Methylphenol & 4-Methylphenol
GC/MS	EPA 625	2-Methylphenol, 3-methylphenol and 4-methylphenol
GC/MS	EPA 625	Methylphenols (total)
GC/MS	EPA 625	Naphthalene
GC/MS	EPA 625	1,4-Naphthoquinone
GC/MS	EPA 625	1-Naphthylamine
GC/MS	EPA 625	2-Naphthylamine
GC/MS	EPA 625	2-Nitroaniline
GC/MS	EPA 625	3-Nitroaniline
GC/MS	EPA 625	4-Nitroaniline
GC/MS	EPA 625	Nitrobenzene
GC/MS	EPA 625	2-Nitrophenol
GC/MS	EPA 625	4-Nitrophenol
GC/MS	EPA 625	4-Nitroquinoline-1-oxide
GC/MS	EPA 625	N-Nitrosodi-n-butylamine
GC/MS	EPA 625	N-Nitrosodiethylamine
GC/MS	EPA 625	N-Nitrosodimethylamine
GC/MS	EPA 625	N-Nitrosodiphenylamine
GC/MS	EPA 625	N-Nitrosodi-n-propylamine
GC/MS	EPA 625	N-Nitrosomethylethylamine
GC/MS	EPA 625	N-Nitrosomorpholine
GC/MS	EPA 625	N-Nitrosopiperidine

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 625	N-Nitrosopyrrolidine
GC/MS	EPA 625	5-Nitro-o-toluidine
GC/MS	EPA 625	2,2'-oxybis(1-Chloropropane)
GC/MS	EPA 625	Parathion
GC/MS	EPA 625	Pentachlorobenzene
GC/MS	EPA 625	Pentachloroethane
GC/MS	EPA 625	Pentachloronitrobenzene
GC/MS	EPA 625	Pentachlorophenol
GC/MS	EPA 625	Phenacetin
GC/MS	EPA 625	Phenanthrene
GC/MS	EPA 625	Phenol
GC/MS	EPA 625	p-Phenylene diamine
GC/MS	EPA 625	Phorate
GC/MS	EPA 625	2-Picoline
GC/MS	EPA 625	Pronamide
GC/MS	EPA 625	Pyrene
GC/MS	EPA 625	Pyridine
GC/MS	EPA 625	Safrole
GC/MS	EPA 625	Sulfotepp
GC/MS	EPA 625	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 625	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 625	Tetraethyldithiopyrophosphate (Sulfotepp)
GC/MS	EPA 625	Thionazin
GC/MS	EPA 625	o-Toluidine
GC/MS	EPA 625	Tributyl phosphate
GC/MS	EPA 625	1,2,4-Trichlorobenzene
GC/MS	EPA 625	2,4,5-Trichlorophenol
GC/MS	EPA 625	2,4,6-Trichlorophenol
GC/MS	EPA 625	O,O,O-Triethyl phosphorothioate
GC/MS	EPA 625	1,3,5-Trinitrobenzene
GC/MS	EPA 625	Tris(2-chloroethyl)phosphate
GC/MS	EPA 625	1-Methyl naphthalene
GC-ECD	EPA 8081B	Aldrin
GC-ECD	EPA 8081B	alpha-BHC
GC-ECD	EPA 8081B	beta-BHC
GC-ECD	EPA 8081B	delta-BHC
GC-ECD	EPA 8081B	gamma-BHC (Lindane)
GC-ECD	EPA 8081B	alpha-Chlordane

Non-Potable Water		
Technology	**Method**	**Analyte**
GC-ECD	EPA 8081B	gamma-Chlordane
GC-ECD	EPA 8081B	Chlordane (technical)
GC-ECD	EPA 8081B	4,4'-DDD
GC-ECD	EPA 8081B	2,4'-DDD
GC-ECD	EPA 8081B	4,4'-DDE
GC-ECD	EPA 8081B	2,4'-DDE
GC-ECD	EPA 8081B	4,4'-DDT
GC-ECD	EPA 8081B	2,4'-DDT
GC-ECD	EPA 8081B	Dieldrin
GC-ECD	EPA 8081B	Endosulfan I
GC-ECD	EPA 8081B	Endosulfan II
GC-ECD	EPA 8081B	Endosulfan sulfate
GC-ECD	EPA 8081B	Endrin
GC-ECD	EPA 8081B	Endrin aldehyde
GC-ECD	EPA 8081B	Endrin ketone
GC-ECD	EPA 8081B	Heptachlor
GC-ECD	EPA 8081B	Heptachlor epoxide
GC-ECD	EPA 8081B	Methoxychlor
GC-ECD	EPA 8081B	Toxaphene
GC-ECD	EPA 608	Aldrin
GC-ECD	EPA 608	alpha-BHC
GC-ECD	EPA 608	beta-BHC
GC-ECD	EPA 608	delta-BHC
GC-ECD	EPA 608	gamma-BHC (Lindane)
GC-ECD	EPA 608	alpha-Chlordane
GC-ECD	EPA 608	gamma-Chlordane
GC-ECD	EPA 608	Chlordane (technical)
GC-ECD	EPA 608	4,4'-DDD
GC-ECD	EPA 608	2,4'-DDD
GC-ECD	EPA 608	4,4'-DDE
GC-ECD	EPA 608	2,4'-DDE
GC-ECD	EPA 608	4,4'-DDT
GC-ECD	EPA 608	2,4'-DDT
GC-ECD	EPA 608	Dieldrin
GC-ECD	EPA 608	Endosulfan I
GC-ECD	EPA 608	Endosulfan II

Non-Potable Water

Technology	Method	Analyte
GC-ECD	EPA 608	Endosulfan sulfate
GC-ECD	EPA 608	Endrin
GC-ECD	EPA 608	Endrin aldehyde
GC-ECD	EPA 608	Endrin ketone
GC-ECD	EPA 608	Heptachlor
GC-ECD	EPA 608	Heptachlor epoxide
GC-ECD	EPA 608	Methoxychlor
GC-ECD	EPA 608	Toxaphene
GC-ECD	EPA 608	Aroclor 1016
GC-ECD	EPA 608	Aroclor 1221
GC-ECD	EPA 608	Aroclor 1232
GC-ECD	EPA 608	Aroclor 1242
GC-ECD	EPA 608	Aroclor 1248
GC-ECD	EPA 608	Aroclor 1254
GC-ECD	EPA 608	Aroclor 1260
GC-ECD	EPA 608	Aroclor 1262
GC-ECD	EPA 608	Aroclor 1268
GC-ECD	EPA 8082A	Aroclor 1016
GC-ECD	EPA 8082A	Aroclor 1221
GC-ECD	EPA 8082A	Aroclor 1232
GC-ECD	EPA 8082A	Aroclor 1242
GC-ECD	EPA 8082A	Aroclor 1248
GC-ECD	EPA 8082A	Aroclor 1254
GC-ECD	EPA 8082A	Aroclor 1260
GC-ECD	EPA 8082A	Aroclor 1262
GC-ECD	EPA 8082A	Aroclor 1268
GC-ECD	EPA 8151A	2,4-D
GC-ECD	EPA 8151A	Dalapon
GC-ECD	EPA 8151A	2,4-DB
GC-ECD	EPA 8151A	Dicamba
GC-ECD	EPA 8151A	Dichlorprop
GC-ECD	EPA 8151A	Dinoseb
GC-ECD	EPA 8151A	2,4,5-TP (Silvex)
GC-ECD	EPA 8151A	2,4,5-T
GC-FID	RSK-175	Methane
GC-FID	RSK-175	Ethane

Non-Potable Water

Technology	Method	Analyte
GC-FID	RSK-175	Ethene
GC-FID	RSK-175	Acetylene
GC-FID	EPA 8015B	Ethanol
GC-FID	EPA 8015B	Methanol
GC-FID	EPA 8015B	Ethylene glycol
GC-FID	EPA 8015B	Propylene glycol
GC-FID	EPA 8015B	Diesel Range Organics
GC-FID	EPA 8015B	Motor Oil Range Organics
GC-FID	EPA 8015B	TPH (as Diesel)
GC-FID	EPA 8015B	Gasoline Range Organics
LC/MS/MS	EPA 8321A	2-Amino-4,6-dinitrotoluene
LC/MS/MS	EPA 8321A	4-Amino-2,6-dinitrotoluene
LC/MS/MS	EPA 8321A	3,5-Dinitroaniline
LC/MS/MS	EPA 8321A	1,3-Dinitrobenzene
LC/MS/MS	EPA 8321A	2,4-Dinitrotoluene
LC/MS/MS	EPA 8321A	2,6-Dinitrotoluene
LC/MS/MS	EPA 8321A	DNX
LC/MS/MS	EPA 8321A	HMX
LC/MS/MS	EPA 8321A	HNAB
LC/MS/MS	EPA 8321A	HNS
LC/MS/MS	EPA 8321A	MNX
LC/MS/MS	EPA 8321A	Nitrobenzene
LC/MS/MS	EPA 8321A	Nitroglycerin
LC/MS/MS	EPA 8321A	4-Nitrotoluene
LC/MS/MS	EPA 8321A	3-Nitrotoluene
LC/MS/MS	EPA 8321A	2-Nitrotoluene
LC/MS/MS	EPA 8321A	PETN
LC/MS/MS	EPA 8321A	RDX
LC/MS/MS	EPA 8321A	TATB
LC/MS/MS	EPA 8321A	Tetryl
LC/MS/MS	EPA 8321A	TNX
LC/MS/MS	EPA 8321A	1,3,5-Trinitrobenzene
LC/MS/MS	EPA 8321A	2,4,6-Trinitrotoluene
LC/MS/MS	EPA 8321A	Tris (o-cresyl) Phosphate
LC/MS/MS	EPA 8321A	2,4-diamino-6-nitrotoluene
LC/MS/MS	EPA 8321A	2,6-diamino-4-nitrotoluene

Non-Potable Water

Technology	Method	Analyte
HPLC	EPA 8330B	2-Amino-4,6-dinitrotoluene
HPLC	EPA 8330B	4-Amino-2,6-dinitrotoluene
HPLC	EPA 8330B	1,3-Dinitrobenzene
HPLC	EPA 8330B	2,4-Dinitrotoluene
HPLC	EPA 8330B	2,6-Dinitrotoluene
HPLC	EPA 8330B	HMX
HPLC	EPA 8330B	HNAB
HPLC	EPA 8330B	HNS
HPLC	EPA 8330B	Nitrobenzene
HPLC	EPA 8330B	Nitroglycerin
HPLC	EPA 8330B	2-Nitrotoluene
HPLC	EPA 8330B	3-Nitrotoluene
HPLC	EPA 8330B	4-Nitrotoluene
HPLC	EPA 8330B	PETN
HPLC	EPA 8330B	RDX
HPLC	EPA 8330B	TATB
HPLC	EPA 8330B	Tetryl
HPLC	EPA 8330B	MNX
HPLC	EPA 8330B	DNX
HPLC	EPA 8330B	TNX
HPLC	EPA 8330B	1,3,5-Trinitrobenzene
HPLC	EPA 8330B	2,4,6-Trinitrotoluene
GC/MS	EPA 8270D SIM	Acenaphthene
GC/MS	EPA 8270D SIM	Acenaphthylene
GC/MS	EPA 8270D SIM	Anthracene
GC/MS	EPA 8270D SIM	Benzo(a)anthracene
GC/MS	EPA 8270D SIM	Benzo(b)fluoranthene
GC/MS	EPA 8270D SIM	Benzo(k)fluoranthene
GC/MS	EPA 8270D SIM	Benzo(ghi)perylene
GC/MS	EPA 8270D SIM	Benzo(a)pyrene
GC/MS	EPA 8270D SIM	Chrysene
GC/MS	EPA 8270D SIM	Dibenz(a,h)anthracene
GC/MS	EPA 8270D SIM	Fluoranthene
GC/MS	EPA 8270D SIM	Fluorene
GC/MS	EPA 8270D SIM	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270D SIM	Naphthalene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270D SIM	Phenanthrene
GC/MS	EPA 8270D SIM	Pyrene
LC/MS/MS	EPA 6850	Perchlorate
ICP-MS	EPA 6020A	Aluminum
ICP-MS	EPA 6020A	Antimony
ICP-MS	EPA 6020A	Arsenic
ICP-MS	EPA 6020A	Barium
ICP-MS	EPA 6020A	Beryllium
ICP-MS	EPA 6020A	Bismuth
ICP-MS	EPA 6020A	Boron
ICP-MS	EPA 6020A	Cadmium
ICP-MS	EPA 6020A	Calcium
ICP-MS	EPA 6020A	Cerium
ICP-MS	EPA 6020A	Cesium
ICP-MS	EPA 6020A	Chromium
ICP-MS	EPA 6020A	Cobalt
ICP-MS	EPA 6020A	Copper
ICP-MS	EPA 6020A	Hafnium
ICP-MS	EPA 6020A	Iron
ICP-MS	EPA 6020A	Lanthanum
ICP-MS	EPA 6020A	Lead
ICP-MS	EPA 6020A	Lithium
ICP-MS	EPA 6020A	Magnesium
ICP-MS	EPA 6020A	Manganese
ICP-MS	EPA 6020A	Molybdenum
ICP-MS	EPA 6020A	Neodymium
ICP-MS	EPA 6020A	Nickel
ICP-MS	EPA 6020A	Niobium
ICP-MS	EPA 6020A	Palladium
ICP-MS	EPA 6020A	Phosphorus
ICP-MS	EPA 6020A	Platinum
ICP-MS	EPA 6020A	Potassium
ICP-MS	EPA 6020A	Praseodymium
ICP-MS	EPA 6020A	Rhodium
ICP-MS	EPA 6020A	Ruthenium
ICP-MS	EPA 6020A	Samarium

LABORATORY ACCREDITATION BUREAU

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-MS	EPA 6020A	Selenium
ICP-MS	EPA 6020A	Silicon
ICP-MS	EPA 6020A	Silver
ICP-MS	EPA 6020A	Sodium
ICP-MS	EPA 6020A	Strontium
ICP-MS	EPA 6020A	Sulfur
ICP-MS	EPA 6020A	Tantalum
ICP-MS	EPA 6020A	Tellurium
ICP-MS	EPA 6020A	Thallium
ICP-MS	EPA 6020A	Thorium
ICP-MS	EPA 6020A	Tin
ICP-MS	EPA 6020A	Titanium
ICP-MS	EPA 6020A	Tungsten
ICP-MS	EPA 6020A	Uranium
ICP-MS	EPA 6020A	Uranium 233
ICP-MS	EPA 6020A	Uranium 234
ICP-MS	EPA 6020A	Uranium 235
ICP-MS	EPA 6020A	Uranium 236
ICP-MS	EPA 6020A	Uranium 238
ICP-MS	EPA 6020A	Vanadium
ICP-MS	EPA 6020A	Yttrium
ICP-MS	EPA 6020A	Zinc
ICP-MS	EPA 6020A	Zirconium
ICP-MS	EPA 200.8	Aluminum
ICP-MS	EPA 200.8	Antimony
ICP-MS	EPA 200.8	Arsenic
ICP-MS	EPA 200.8	Barium
ICP-MS	EPA 200.8	Beryllium
ICP-MS	EPA 200.8	Bismuth
ICP-MS	EPA 200.8	Boron
ICP-MS	EPA 200.8	Cadmium
ICP-MS	EPA 200.8	Calcium
ICP-MS	EPA 200.8	Cerium
ICP-MS	EPA 200.8	Cesium
ICP-MS	EPA 200.8	Chromium
ICP-MS	EPA 200.8	Cobalt

Non-Potable Water

Technology	Method	Analyte
ICP-MS	EPA 200.8	Copper
ICP-MS	EPA 200.8	Hafnium
ICP-MS	EPA 200.8	Iron
ICP-MS	EPA 200.8	Lanthanum
ICP-MS	EPA 200.8	Lead
ICP-MS	EPA 200.8	Lithium
ICP-MS	EPA 200.8	Magnesium
ICP-MS	EPA 200.8	Manganese
ICP-MS	EPA 200.8	Molybdenum
ICP-MS	EPA 200.8	Neodymium
ICP-MS	EPA 200.8	Nickel
ICP-MS	EPA 200.8	Niobium
ICP-MS	EPA 200.8	Palladium
ICP-MS	EPA 200.8	Phosphorus
ICP-MS	EPA 200.8	Platinum
ICP-MS	EPA 200.8	Potassium
ICP-MS	EPA 200.8	Praseodymium
ICP-MS	EPA 200.8	Rhodium
ICP-MS	EPA 200.8	Ruthenium
ICP-MS	EPA 200.8	Samarium
ICP-MS	EPA 200.8	Selenium
ICP-MS	EPA 200.8	Silicon
ICP-MS	EPA 200.8	Silver
ICP-MS	EPA 200.8	Sodium
ICP-MS	EPA 200.8	Strontium
ICP-MS	EPA 200.8	Sulfur
ICP-MS	EPA 200.8	Tantalum
ICP-MS	EPA 200.8	Tellurium
ICP-MS	EPA 200.8	Thallium
ICP-MS	EPA 200.8	Thorium
ICP-MS	EPA 200.8	Tin
ICP-MS	EPA 200.8	Titanium
ICP-MS	EPA 200.8	Tungsten
ICP-MS	EPA 200.8	Uranium
ICP-MS	EPA 200.8	Vanadium
ICP-MS	EPA 200.8	Yttrium

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-MS	EPA 200.8	Zinc
ICP-MS	EPA 200.8	Zirconium
ICP-AES	EPA 200.7	Aluminum
ICP-AES	EPA 200.7	Antimony
ICP-AES	EPA 200.7	Arsenic
ICP-AES	EPA 200.7	Barium
ICP-AES	EPA 200.7	Beryllium
ICP-AES	EPA 200.7	Bismuth
ICP-AES	EPA 200.7	Boron
ICP-AES	EPA 200.7	Cadmium
ICP-AES	EPA 200.7	Calcium
ICP-AES	EPA 200.7	Chromium
ICP-AES	EPA 200.7	Cobalt
ICP-AES	EPA 200.7	Copper
ICP-AES	EPA 200.7	Iron
ICP-AES	EPA 200.7	Lead
ICP-AES	EPA 200.7	Lithium
ICP-AES	EPA 200.7	Magnesium
ICP-AES	EPA 200.7	Manganese
ICP-AES	EPA 200.7	Molybdenum
ICP-AES	EPA 200.7	Nickel
ICP-AES	EPA 200.7	Phosphorus
ICP-AES	EPA 200.7	Potassium
ICP-AES	EPA 200.7	Selenium
ICP-AES	EPA 200.7	Silicon
ICP-AES	EPA 200.7	Silver
ICP-AES	EPA 200.7	Sodium
ICP-AES	EPA 200.7	Strontium
ICP-AES	EPA 200.7	Sulfur
ICP-AES	EPA 200.7	Thallium
ICP-AES	EPA 200.7	Thorium
ICP-AES	EPA 200.7	Tin
ICP-AES	EPA 200.7	Titanium
ICP-AES	EPA 200.7	Uranium
ICP-AES	EPA 200.7	Vanadium
ICP-AES	EPA 200.7	Zinc

Non-Potable Water

Technology	Method	Analyte
CVAA	EPA 7470A	Mercury
Colorimetric	EPA 9010C EPA 9012B	Cyanide
Ion Chromatrography	EPA 300.0/9056A	Bromide
Ion Chromatrography	EPA 300.0/9056A	Chloride
Ion Chromatrography	EPA 300.0/9056A	Fluoride
Ion Chromatrography	EPA 300.0/9056A	Nitrate
Ion Chromatrography	EPA 300.0/9056A	Nitrite
Ion Chromatrography	EPA 300.0/9056A	Sulfate
Ion Chromatrography	EPA 300.0/9056A	Ortho-phosphate
Ion Chromatrography	EPA 300.0/9056A	Iodide
Ion Chromatrography	EPA 314.0	Perchlorate
Gravimetric	SM 2540B SM 2540C SM 2540D	Solids
Probe	EPA 9040C EPA 9045D EPA 150.1	pH
Titration	SM 2320B EPA 310.1	Alkalinity
Titration	EPA 9030	Sulfide
Penske-Martin	EPA 1010A	Ignitability
Colormetric	EPA 353.1	nitrate/Nitrite
Colormetric	EPA 350.1	Ammonia
TOC Analyzer	EPA 9060A	TOC
Tritrmetric	EPA 9020B	TOX
Colormetric	EPA 7196A	Hex Chromium
Gravimetric	EPA 1664A	Oil & Grease
Gravimetric	EPA 1664A	TPH
Probe	EPA 9050A	Conductivity
Gas Flow Proportional Counter	EPA 900.0 EPA 9310	gross alpha/beta
Gas Flow Proportional Counter	EPA 903.0 EPA 9315	Radium-226
Gas Flow Proportional Counter	EPA 903.0 EPA 9315	total radium

Certificate # L2305

Non-Potable Water		
Technology	**Method**	**Analyte**
Gas Flow Proportional Counter	EPA 904.0 EPA 9320	Radium-228
Gas Flow Proportional Counter	EPA 905.0 / DOE HASL 300 Sr-02	Strontium-90
Liquid Scintillation Counter	EPA 906.0	Tritium
Liquid Scintillation Counter	Eichrom Technologies TCW01/TCS01	Tecnetium-99
Liquid Scintillation Counter	EERF C-01-C14	Carbon-14
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Gamma Emitters:
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Actinium 227 (assumes equilibrium w/ Th-227)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Actinium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Americium 241
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Antimony 124
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Antimony 125
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium-137
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium/Lanthanum-140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium 133
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium 140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Beryllium 7
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 211 eq Th-227
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 207
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth-210M
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 212
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 214
Gamma Spectroscopy	EPA 901.1 / DOE	Calcium-45

Non-Potable Water		
Technology	**Method**	**Analyte**
	HASL 300 Ga-01-R	
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 141
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 139
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 144
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cesium 134
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cesium 137
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 56
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 57
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 58
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 60
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 152
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 154
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 155
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Hafnium 181
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iodine 131
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iridium 192
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iron 59
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lanthanum 140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 210
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 211
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 212
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 214

Non-Potable Water		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Manganese-56
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Manganese 54
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Mercury 203
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Neptunium 237
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Neptunium 239
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 83
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 94
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 95
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Potassium 40
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 144
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 146
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 147
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 234M
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 231
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 234
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium (226)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 223 (assumes equilibrium w/ Th-227)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 224
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Ruthenium 106
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Scandium 46
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Sodium 22

Non-Potable Water		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Sodium 24
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Strontium 85
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thallium 208
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 227
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 230
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 231
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 232
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 234
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Tin 113
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Uranium 235
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Uranium 238
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Vanadium-48
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Yttrium 88
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Zinc 65
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Zirconium 95
Alpha Spectroscopy	DOE HASL 300 A-01-R	Alpha spec analysis:
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Uranium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Thorium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Americium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Plutonium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Neptunium

Non-Potable Water

Technology	Method	Analyte
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Curium
Liquid Scintillation Counter	Eichrom Technologies OTW01, OTS01	Lead-210
Alpha Spectroscopy	Laboratory SOP ST-RC-0210	Polonium-210
Liquid Scintillation Counter	Eichrom Technologies FEW01	Iron-55
Liquid Scintillation Counter	DOE RP-300	Nickel 59/63
Liquid Scintillation Counter	SM 7500-IB	Iodine-129
Preparation	**Method**	**Type**
Organic Extraction & Sample Prep	EPA 3500C	Organic Extraction & Sample Prep
Volatile Prep	EPA 5000	Sample Preparation for Volatile Organic Compounds
Organic Cleanup	EPA 3600A	Cleanup for Organic extracts
Organic prep/analysis	EPA 8000C	Determinative Chromatographic Separations
Acid Digestion (Aqueous samples)	EPA 3010A	Acid Digestion for Metals (Aqueous samples)
Purge & Trap	EPA 5030C	Purge & Trap for Aqueous Volatile
Sep Funnel Liquid-Liquid Extraction	EPA 3510C	Sep Funnel Liquid-Liquid Extraction
Organic Cleanup	EPA 3600A	Cleanup for Organic extracts
Florisil Cleanup	EPA 3620C	Florisil Cleanup
Sulfur Cleanup	EPA 3660B	Sulfur Cleanup
Acid Clean Up	EPA 3665A	Acid Clean Up for PCBs
TCLP Extraction	EPA 1311	TCLP Extraction
SPLP Extraction	EPA 1312	SPLP Extraction
CWET Extraction	CA Title 22	CWET Extraction
Solid Phase Extraction	EPA 3535A	Solid Phase Extraction

Drinking Water		
Technology	**Method**	**Analyte**
Gas Flow Proportional Counter	EPA 900.0 EPA 9310	gross alpha/beta
Gas Flow Proportional Counter	EPA 903.0 EPA 9315	Radium-226
Gas Flow Proportional Counter	EPA 904.0 EPA 9320	Radium-228
Gas Flow Proportional Counter	EPA 905.0 / DOE HASL 300 Sr-02	Strontium-90
Liquid Scintillation Counter	EPA 906.0	Tritium
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Gamma Emitters:
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Actinium 227 (assumes equilibrium w/ Th-227)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Actinium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Americium 241
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Antimony 124
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Antimony 125
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium-137
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium/Lanthanum-140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium 133
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium 140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Beryllium 7
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 211 eq Th-227
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 207
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth-210M

Drinking Water		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 212
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 214
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Calcium-45
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 141
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 139
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 144
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cesium 134
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cesium 137
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 56
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 57
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 58
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 60
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 152
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 154
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 155
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Hafnium 181
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iodine 131
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iridium 192
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iron 59
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lanthanum 140

Drinking Water		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 210
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 211
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 212
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 214
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Manganese-56
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Manganese 54
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Mercury 203
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Neptunium 237
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Neptunium 239
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 83
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 94
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 95
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Potassium 40
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 144
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 146
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 147
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 234M
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 231
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 234
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium (226)

Drinking Water		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 223 (assumes equilibrium w/ Th-227)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 224
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Ruthenium 106
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Scandium 46
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Sodium 22
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Sodium 24
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Strontium 85
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thallium 208
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 227
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 230
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 231
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 232
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 234
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Tin 113
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Uranium 235
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Uranium 238
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Vanadium-48
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Yttrium 88

Drinking Water		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Zinc 65
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Zirconium 95

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010C	Aluminum
ICP-AES	EPA 6010C	Antimony
ICP-AES	EPA 6010C	Arsenic
ICP-AES	EPA 6010C	Barium
ICP-AES	EPA 6010C	Beryllium
ICP-AES	EPA 6010C	Bismuth
ICP-AES	EPA 6010C	Boron
ICP-AES	EPA 6010C	Cadmium
ICP-AES	EPA 6010C	Calcium
ICP-AES	EPA 6010C	Chromium
ICP-AES	EPA 6010C	Cobalt
ICP-AES	EPA 6010C	Copper
ICP-AES	EPA 6010C	Iron
ICP-AES	EPA 6010C	Lead
ICP-AES	EPA 6010C	Lithium
ICP-AES	EPA 6010C	Magnesium
ICP-AES	EPA 6010C	Manganese
ICP-AES	EPA 6010C	Molybdenum
ICP-AES	EPA 6010C	Nickel
ICP-AES	EPA 6010C	Phosphorus
ICP-AES	EPA 6010C	Potassium
ICP-AES	EPA 6010C	Selenium
ICP-AES	EPA 6010C	Silicon
ICP-AES	EPA 6010C	Silver
ICP-AES	EPA 6010C	Sodium
ICP-AES	EPA 6010C	Strontium
ICP-AES	EPA 6010C	Sulfur

Solid and Chemical Materials

Technology	Method	Analyte
ICP-AES	EPA 6010C	Thallium
ICP-AES	EPA 6010C	Thorium
ICP-AES	EPA 6010C	Tin
ICP-AES	EPA 6010C	Titanium
ICP-AES	EPA 6010C	Uranium
ICP-AES	EPA 6010C	Vanadium
ICP-AES	EPA 6010C	Zinc
GC/MS	EPA 8260C	Acetone
GC/MS	EPA 8260C	Acetonitrile
GC/MS	EPA 8260C	Acrolein
GC/MS	EPA 8260C	Acrylonitrile
GC/MS	EPA 8260C	Benzene
GC/MS	EPA 8260C	Benzyl chloride
GC/MS	EPA 8260C	Bromobenzene
GC/MS	EPA 8260C	Bromochloromethane
GC/MS	EPA 8260C	Bromodichloromethane
GC/MS	EPA 8260C	Bromoform
GC/MS	EPA 8260C	Bromomethane
GC/MS	EPA 8260C	n-Butanol
GC/MS	EPA 8260C	2-Butanone
GC/MS	EPA 8260C	n-Butylbenzene
GC/MS	EPA 8260C	sec-Butylbenzene
GC/MS	EPA 8260C	tert-Butylbenzene
GC/MS	EPA 8260C	Carbon disulfide
GC/MS	EPA 8260C	Carbon tetrachloride
GC/MS	EPA 8260C	Chlorobenzene
GC/MS	EPA 8260C	Chlorobromomethane
GC/MS	EPA 8260C	2-Chloro-1,3-butadiene
GC/MS	EPA 8260C	Chlorodibromomethane
GC/MS	EPA 8260C	Dibromochloromethane
GC/MS	EPA 8260C	Chloroethane
GC/MS	EPA 8260C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260C	Chloroform
GC/MS	EPA 8260C	Chloromethane
GC/MS	EPA 8260C	Allyl chloride
GC/MS	EPA 8260C	2-Chlorotoluene

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8260C	4-Chlorotoluene
GC/MS	EPA 8260C	Cyclohexane
GC/MS	EPA 8260C	Cyclohexanone
GC/MS	EPA 8260C	1,2-Dibromo-3-chloropropane
GC/MS	EPA 8260C	1,2-Dibromoethane
GC/MS	EPA 8260C	Dibromomethane
GC/MS	EPA 8260C	1,2-Dichlorobenzene
GC/MS	EPA 8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260C	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260C	Dichlorodifluoromethane
GC/MS	EPA 8260C	1,1-Dichloroethane
GC/MS	EPA 8260C	1,2-Dichloroethane
GC/MS	EPA 8260C	cis-1,2-Dichloroethene
GC/MS	EPA 8260C	trans-1,2-Dichloroethene
GC/MS	EPA 8260C	1,1-Dichloroethene
GC/MS	EPA 8260C	1,2-Dichloroethene (total)
GC/MS	EPA 8260C	1,2-Dichloropropane
GC/MS	EPA 8260C	1,3-Dichloropropane
GC/MS	EPA 8260C	2,2-Dichloropropane
GC/MS	EPA 8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260C	trans-1,3-Dichloropropene
GC/MS	EPA 8260C	1,1-Dichloropropene
GC/MS	EPA 8260C	1,2-Dichloro-1,1,2,2-tetrafluoroethane
GC/MS	EPA 8260C	Dimethyl disulfide
GC/MS	EPA 8260C	1,4-Dioxane
GC/MS	EPA 8260C	Ethyl acetate
GC/MS	EPA 8260C	Ethylbenzene
GC/MS	EPA 8260C	Ethyl ether
GC/MS	EPA 8260C	Diethyl ether
GC/MS	EPA 8260C	Ethyl methacrylate
GC/MS	EPA 8260C	Freon 113
GC/MS	EPA 8260C	Hexachlorobutadiene
GC/MS	EPA 8260C	n-Hexane
GC/MS	EPA 8260C	2-Hexanone
GC/MS	EPA 8260C	Iodomethane

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8260C	Isobutanol
GC/MS	EPA 8260C	Isopropylbenzene
GC/MS	EPA 8260C	p-Isopropyltoluene
GC/MS	EPA 8260C	Methacrylonitrile
GC/MS	EPA 8260C	Methyl acetate
GC/MS	EPA 8260C	Methyl butyl ketone
GC/MS	EPA 8260C	Methylcyclohexane
GC/MS	EPA 8260C	Dichloromethane
GC/MS	EPA 8260C	Methylene chloride
GC/MS	EPA 8260C	Methyl methacrylate
GC/MS	EPA 8260C	4-Methyl-2-pentanone
GC/MS	EPA 8260C	MTBE
GC/MS	EPA 8260C	Naphthalene
GC/MS	EPA 8260C	2-Nitropropane
GC/MS	EPA 8260C	Nonanal
GC/MS	EPA 8260C	Pentachloroethane
GC/MS	EPA 8260C	Propionitrile
GC/MS	EPA 8260C	n-Propylbenzene
GC/MS	EPA 8260C	Styrene
GC/MS	EPA 8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260C	Tetrachloroethene
GC/MS	EPA 8260C	Tetrahydrofuran
GC/MS	EPA 8260C	Toluene
GC/MS	EPA 8260C	1,3,5-Trichlorobenzene
GC/MS	EPA 8260C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260C	Trichloroethene
GC/MS	EPA 8260C	Trichlorofluoromethane
GC/MS	EPA 8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260C	Trichlorotrifluoroethane
GC/MS	EPA 8260C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260C	1,3,5-Trimethylbenzene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260C	Vinyl acetate
GC/MS	EPA 8260C	Vinyl chloride
GC/MS	EPA 8260C	m-Xylene & p-Xylene
GC/MS	EPA 8260C	o-Xylene
GC/MS	EPA 8260C	Xylenes (total)
GC/MS	EPA 8270D	Acenaphthene
GC/MS	EPA 8270D	Acenaphthylene
GC/MS	EPA 8270D	Acetophenone
GC/MS	EPA 8270D	2-Acetylaminofluorene
GC/MS	EPA 8270D	4-Aminobiphenyl
GC/MS	EPA 8270D	Aniline
GC/MS	EPA 8270D	Anthracene
GC/MS	EPA 8270D	Aramite (total)
GC/MS	EPA 8270D	Atrazine
GC/MS	EPA 8270D	Azobenzene
GC/MS	EPA 8270D	Benzaldehyde
GC/MS	EPA 8270D	Benzidine
GC/MS	EPA 8270D	Benzo(a)anthracene
GC/MS	EPA 8270D	Benzo(b)fluoranthene
GC/MS	EPA 8270D	Benzo(k)fluoranthene
GC/MS	EPA 8270D	Benzoic acid
GC/MS	EPA 8270D	Benzo(ghi)perylene
GC/MS	EPA 8270D	Benzo(a)pyrene
GC/MS	EPA 8270D	Benzyl alcohol
GC/MS	EPA 8270D	1,1'-Biphenyl
GC/MS	EPA 8270D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270D	bis(2-Chloroethyl) ether
GC/MS	EPA 8270D	bis(2-Chloroisopropyl) ether
GC/MS	EPA 8270D	bis(2-Ethylhexyl) phthalate
GC/MS	EPA 8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270D	n-Butylbenzenesulfonamide
GC/MS	EPA 8270D	Butyl benzyl phthalate
GC/MS	EPA 8270D	Caprolactam
GC/MS	EPA 8270D	Carbazole
GC/MS	EPA 8270D	4-Chloroaniline
GC/MS	EPA 8270D	Chlorobenzilate

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8270D	p-Chlorobenzilate
GC/MS	EPA 8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270D	2-Chloronaphthalene
GC/MS	EPA 8270D	2-Chlorophenol
GC/MS	EPA 8270D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270D	Chrysene
GC/MS	EPA 8270D	Cresols (total)
GC/MS	EPA 8270D	Cyclohexanol
GC/MS	EPA 8270D	Diallate
GC/MS	EPA 8270D	Dibenz(a,h)anthracene
GC/MS	EPA 8270D	Dibenzo(a,h)anthracene
GC/MS	EPA 8270D	Dibenzofuran
GC/MS	EPA 8270D	Di-n-butyl phthalate
GC/MS	EPA 8270D	1,2-Dichlorobenzene
GC/MS	EPA 8270D	1,3-Dichlorobenzene
GC/MS	EPA 8270D	1,4-Dichlorobenzene
GC/MS	EPA 8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270D	2,4-Dichlorophenol
GC/MS	EPA 8270D	2,6-Dichlorophenol
GC/MS	EPA 8270D	Diethyl phthalate
GC/MS	EPA 8270D	O,O-Diethyl-O-(2-pyrazinyl) phosphorothioate
GC/MS	EPA 8270D	Dimethoate
GC/MS	EPA 8270D	p-Dimethylaminoazobenzene
GC/MS	EPA 8270D	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270D	3,3'-Dimethylbenzidine
GC/MS	EPA 8270D	Dimethylformamide
GC/MS	EPA 8270D	alpha,alpha-Dimethylphenethylamine
GC/MS	EPA 8270D	2,4-Dimethylphenol
GC/MS	EPA 8270D	Dimethyl phthalate
GC/MS	EPA 8270D	1,3-Dinitrobenzene
GC/MS	EPA 8270D	1,4-Dinitrobenzene
GC/MS	EPA 8270D	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270D	2,4-Dinitrophenol
GC/MS	EPA 8270D	2,4-Dinitrotoluene
GC/MS	EPA 8270D	2,6-Dinitrotoluene
GC/MS	EPA 8270D	2-sec-Butyl-4,6-dinitrophenol

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8270D	Dinoseb
GC/MS	EPA 8270D	Di-n-octyl phthalate
GC/MS	EPA 8270D	1,4-Dioxane
GC/MS	EPA 8270D	1,2-Diphenylhydrazine (as Azobenzene)
GC/MS	EPA 8270D	Disulfoton
GC/MS	EPA 8270D	Ethyl methacrylate
GC/MS	EPA 8270D	Ethyl methanesulfonate
GC/MS	EPA 8270D	Famphur
GC/MS	EPA 8270D	Fluoranthene
GC/MS	EPA 8270D	Fluorene
GC/MS	EPA 8270D	Hexachlorobenzene
GC/MS	EPA 8270D	Hexachlorobutadiene
GC/MS	EPA 8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270D	Hexachloro-1,3-cyclopentadiene
GC/MS	EPA 8270D	Hexachloroethane
GC/MS	EPA 8270D	Hexachlorophene
GC/MS	EPA 8270D	Hexachloropropene
GC/MS	EPA 8270D	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270D	Isodrin
GC/MS	EPA 8270D	Isophorone
GC/MS	EPA 8270D	Isosafrole
GC/MS	EPA 8270D	Kepone
GC/MS	EPA 8270D	Methapyrilene
GC/MS	EPA 8270D	2-Methylbenzenamine
GC/MS	EPA 8270D	3-Methylcholanthrene
GC/MS	EPA 8270D	4,4'-Methylenebis(2-chloroaniline)
GC/MS	EPA 8270D	Methyl methacrylate
GC/MS	EPA 8270D	Methyl methanesulfonate
GC/MS	EPA 8270D	2-Methylnaphthalene
GC/MS	EPA 8270D	Methyl parathion
GC/MS	EPA 8270D	2-Methylphenol
GC/MS	EPA 8270D	3-Methylphenol & 4-Methylphenol
GC/MS	EPA 8270D	2-Methylphenol, 3-methylphenol and 4-methylphenol
GC/MS	EPA 8270D	Methylphenols (total)
GC/MS	EPA 8270D	Naphthalene
GC/MS	EPA 8270D	1,4-Naphthoquinone

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Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270D	1-Naphthylamine
GC/MS	EPA 8270D	2-Naphthylamine
GC/MS	EPA 8270D	2-Nitroaniline
GC/MS	EPA 8270D	3-Nitroaniline
GC/MS	EPA 8270D	4-Nitroaniline
GC/MS	EPA 8270D	Nitrobenzene
GC/MS	EPA 8270D	2-Nitrophenol
GC/MS	EPA 8270D	4-Nitrophenol
GC/MS	EPA 8270D	4-Nitroquinoline-1-oxide
GC/MS	EPA 8270D	N-Nitrosodi-n-butylamine
GC/MS	EPA 8270D	N-Nitrosodiethylamine
GC/MS	EPA 8270D	N-Nitrosodimethylamine
GC/MS	EPA 8270D	N-Nitrosodiphenylamine
GC/MS	EPA 8270D	N-Nitrosodi-n-propylamine
GC/MS	EPA 8270D	N-Nitrosomethylethylamine
GC/MS	EPA 8270D	N-Nitrosomorpholine
GC/MS	EPA 8270D	N-Nitrosopiperidine
GC/MS	EPA 8270D	N-Nitrosopyrrolidine
GC/MS	EPA 8270D	5-Nitro-o-toluidine
GC/MS	EPA 8270D	2,2'-oxybis(1-Chloropropane)
GC/MS	EPA 8270D	Parathion
GC/MS	EPA 8270D	Pentachlorobenzene
GC/MS	EPA 8270D	Pentachloroethane
GC/MS	EPA 8270D	Pentachloronitrobenzene
GC/MS	EPA 8270D	Pentachlorophenol
GC/MS	EPA 8270D	Phenacetin
GC/MS	EPA 8270D	Phenanthrene
GC/MS	EPA 8270D	Phenol
GC/MS	EPA 8270D	p-Phenylene diamine
GC/MS	EPA 8270D	Phorate
GC/MS	EPA 8270D	2-Picoline
GC/MS	EPA 8270D	Pronamide
GC/MS	EPA 8270D	Pyrene
GC/MS	EPA 8270D	Pyridine
GC/MS	EPA 8270D	Safrole
GC/MS	EPA 8270D	Sulfotepp

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270D	Tetraethyldithiopyrophosphate (Sulfotepp)
GC/MS	EPA 8270D	Thionazin
GC/MS	EPA 8270D	o-Toluidine
GC/MS	EPA 8270D	Tributyl phosphate
GC/MS	EPA 8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270D	O,O,O-Triethyl phosphorothioate
GC/MS	EPA 8270D	1,3,5-Trinitrobenzene
GC/MS	EPA 8270D	Tris(2-chloroethyl)phosphate
GC/MS	EPA 8270D	1-Methyl naphthalene
GC-ECD	EPA 8081B	Aldrin
GC-ECD	EPA 8081B	alpha-BHC
GC-ECD	EPA 8081B	beta-BHC
GC-ECD	EPA 8081B	delta-BHC
GC-ECD	EPA 8081B	gamma-BHC (Lindane)
GC-ECD	EPA 8081B	alpha-Chlordane
GC-ECD	EPA 8081B	gamma-Chlordane
GC-ECD	EPA 8081B	Chlordane (technical)
GC-ECD	EPA 8081B	4,4'-DDD
GC-ECD	EPA 8081B	2,4'-DDD
GC-ECD	EPA 8081B	4,4'-DDE
GC-ECD	EPA 8081B	2,4'-DDE
GC-ECD	EPA 8081B	4,4'-DDT
GC-ECD	EPA 8081B	2,4'-DDT
GC-ECD	EPA 8081B	Dieldrin
GC-ECD	EPA 8081B	Endosulfan I
GC-ECD	EPA 8081B	Endosulfan II
GC-ECD	EPA 8081B	Endosulfan sulfate
GC-ECD	EPA 8081B	Endrin
GC-ECD	EPA 8081B	Endrin aldehyde
GC-ECD	EPA 8081B	Endrin ketone
GC-ECD	EPA 8081B	Heptachlor
GC-ECD	EPA 8081B	Heptachlor epoxide

Solid and Chemical Materials

Technology	Method	Analyte
GC-ECD	EPA 8081B	Methoxychlor
GC-ECD	EPA 8081B	Toxaphene
GC-ECD	EPA 8082A	Aroclor 1016
GC-ECD	EPA 8082A	Aroclor 1221
GC-ECD	EPA 8082A	Aroclor 1232
GC-ECD	EPA 8082A	Aroclor 1242
GC-ECD	EPA 8082A	Aroclor 1248
GC-ECD	EPA 8082A	Aroclor 1254
GC-ECD	EPA 8082A	Aroclor 1260
GC-ECD	EPA 8082A	Aroclor 1262
GC-ECD	EPA 8082A	Aroclor 1268
GC-ECD	EPA 8151A	2,4-D
GC-ECD	EPA 8151A	Dalapon
GC-ECD	EPA 8151A	2,4-DB
GC-ECD	EPA 8151A	Dicamba
GC-ECD	EPA 8151A	Dichlorprop
GC-ECD	EPA 8151A	Dinoseb
GC-ECD	EPA 8151A	2,4,5-TP (Silvex)
GC-ECD	EPA 8151A	2,4,5-T
LC/MS/MS	EPA 8321A	2-Amino-4,6-dinitrotoluene
LC/MS/MS	EPA 8321A	4-Amino-2,6-dinitrotoluene
LC/MS/MS	EPA 8321A	3,5-Dinitroaniline
LC/MS/MS	EPA 8321A	1,3-Dinitrobenzene
LC/MS/MS	EPA 8321A	2,4-Dinitrotoluene
LC/MS/MS	EPA 8321A	2,6-Dinitrotoluene
LC/MS/MS	EPA 8321A	DNX
LC/MS/MS	EPA 8321A	HMX
LC/MS/MS	EPA 8321A	HNAB
LC/MS/MS	EPA 8321A	HNS
LC/MS/MS	EPA 8321A	MNX
LC/MS/MS	EPA 8321A	Nitrobenzene
LC/MS/MS	EPA 8321A	Nitroglycerin
LC/MS/MS	EPA 8321A	4-Nitrotoluene
LC/MS/MS	EPA 8321A	3-Nitrotoluene
LC/MS/MS	EPA 8321A	2-Nitrotoluene
LC/MS/MS	EPA 8321A	PETN

Solid and Chemical Materials

Technology	Method	Analyte
LC/MS/MS	EPA 8321A	RDX
LC/MS/MS	EPA 8321A	TATB
LC/MS/MS	EPA 8321A	Tetryl
LC/MS/MS	EPA 8321A	TNX
LC/MS/MS	EPA 8321A	1,3,5-Trinitrobenzene
LC/MS/MS	EPA 8321A	2,4,6-Trinitrotoluene
LC/MS/MS	EPA 8321A	Tris (o-cresyl) Phosphate
LC/MS/MS	EPA 8321A	2,4-diamino-6-nitrotoluene
LC/MS/MS	EPA 8321A	2,6-diamino-4-nitrotoluene
HPLC	EPA 8330B	2-Amino-4,6-dinitrotoluene
HPLC	EPA 8330B	4-Amino-2,6-dinitrotoluene
HPLC	EPA 8330B	1,3-Dinitrobenzene
HPLC	EPA 8330B	2,4-Dinitrotoluene
HPLC	EPA 8330B	2,6-Dinitrotoluene
HPLC	EPA 8330B	HMX
HPLC	EPA 8330B	HNAB
HPLC	EPA 8330B	HNS
HPLC	EPA 8330B	Nitrobenzene
HPLC	EPA 8330B	Nitroglycerin
HPLC	EPA 8330B	2-Nitrotoluene
HPLC	EPA 8330B	3-Nitrotoluene
HPLC	EPA 8330B	4-Nitrotoluene
HPLC	EPA 8330B	PETN
HPLC	EPA 8330B	RDX
HPLC	EPA 8330B	TATB
HPLC	EPA 8330B	Tetryl
HPLC	EPA 8330B	MNX
HPLC	EPA 8330B	DNX
HPLC	EPA 8330B	TNX
HPLC	EPA 8330B	1,3,5-Trinitrobenzene
HPLC	EPA 8330B	2,4,6-Trinitrotoluene
GC/MS	EPA 8270D SIM	Acenaphthene
GC/MS	EPA 8270D SIM	Acenaphthylene
GC/MS	EPA 8270D SIM	Anthracene
GC/MS	EPA 8270D SIM	Benzo(a)anthracene
GC/MS	EPA 8270D SIM	Benzo(b)fluoranthene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270D SIM	Benzo(k)fluoranthene
GC/MS	EPA 8270D SIM	Benzo(ghi)perylene
GC/MS	EPA 8270D SIM	Benzo(a)pyrene
GC/MS	EPA 8270D SIM	Chrysene
GC/MS	EPA 8270D SIM	Dibenz(a,h)anthracene
GC/MS	EPA 8270D SIM	Fluoranthene
GC/MS	EPA 8270D SIM	Fluorene
GC/MS	EPA 8270D SIM	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270D SIM	Naphthalene
GC/MS	EPA 8270D SIM	Phenanthrene
GC/MS	EPA 8270D SIM	Pyrene
GC/MS	EPA 8260C SIM	1,4- dioxane
GC-FID	EPA 8015B	Diesel Range Organics
GC-FID	EPA 8015B	Motor Oil Range Organics
GC-FID	EPA 8015B	TPH (as Diesel)
GC-FID	EPA 8015B	Gasoline Range Organics
GC-FID	EPA 8015B	Ethanol
GC-FID	EPA 8015B	Methanol
GC-FID	EPA 8015B	Ethylene glycol
GC-FID	EPA 8015B	Propylene glycol
LC/MS/MS	EPA 6850	Perchlorate
ICP-MS	EPA 6020A	Aluminum
ICP-MS	EPA 6020A	Antimony
ICP-MS	EPA 6020A	Arsenic
ICP-MS	EPA 6020A	Barium
ICP-MS	EPA 6020A	Beryllium
ICP-MS	EPA 6020A	Bismuth
ICP-MS	EPA 6020A	Boron
ICP-MS	EPA 6020A	Cadmium
ICP-MS	EPA 6020A	Calcium
ICP-MS	EPA 6020A	Cerium
ICP-MS	EPA 6020A	Cesium
ICP-MS	EPA 6020A	Chromium
ICP-MS	EPA 6020A	Cobalt
ICP-MS	EPA 6020A	Copper
ICP-MS	EPA 6020A	Hafnium

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Solid and Chemical Materials

Technology	Method	Analyte
ICP-MS	EPA 6020A	Iron
ICP-MS	EPA 6020A	Lanthanum
ICP-MS	EPA 6020A	Lead
ICP-MS	EPA 6020A	Lithium
ICP-MS	EPA 6020A	Magnesium
ICP-MS	EPA 6020A	Manganese
ICP-MS	EPA 6020A	Molybdenum
ICP-MS	EPA 6020A	Neodymium
ICP-MS	EPA 6020A	Nickel
ICP-MS	EPA 6020A	Niobium
ICP-MS	EPA 6020A	Palladium
ICP-MS	EPA 6020A	Phosphorus
ICP-MS	EPA 6020A	Platinum
ICP-MS	EPA 6020A	Potassium
ICP-MS	EPA 6020A	Praseodymium
ICP-MS	EPA 6020A	Rhodium
ICP-MS	EPA 6020A	Ruthenium
ICP-MS	EPA 6020A	Samarium
ICP-MS	EPA 6020A	Selenium
ICP-MS	EPA 6020A	Silicon
ICP-MS	EPA 6020A	Silver
ICP-MS	EPA 6020A	Sodium
ICP-MS	EPA 6020A	Strontium
ICP-MS	EPA 6020A	Sulfur
ICP-MS	EPA 6020A	Tantalum
ICP-MS	EPA 6020A	Technetium-99
ICP-MS	EPA 6020A	Tellurium
ICP-MS	EPA 6020A	Thallium
ICP-MS	EPA 6020A	Thorium
ICP-MS	EPA 6020A	Tin
ICP-MS	EPA 6020A	Titanium
ICP-MS	EPA 6020A	Tungsten
ICP-MS	EPA 6020A	Uranium
ICP-MS	EPA 6020A	Uranium 233
ICP-MS	EPA 6020A	Uranium 234
ICP-MS	EPA 6020A	Uranium 235

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Solid and Chemical Materials

Technology	Method	Analyte
ICP-MS	EPA 6020A	Uranium 236
ICP-MS	EPA 6020A	Uranium 238
ICP-MS	EPA 6020A	Vanadium
ICP-MS	EPA 6020A	Yttrium
ICP-MS	EPA 6020A	Zinc
ICP-MS	EPA 6020A	Zirconium
CVAA	EPA 7471B	Mercury
Colormetric	EPA 9010C EPA 9012B	Cyanide
Ion Chromatrography	EPA 300.0 EPA 9056A	Bromide
Ion Chromatrography	EPA 300.0 EPA 9056A	Chloride
Ion Chromatrography	EPA 300.0 EPA 9056A	Fluoride
Ion Chromatrography	EPA 300.0 EPA 9056A	Nitrate
Ion Chromatrography	EPA 300.0 EPA 9056A	Nitrite
Ion Chromatrography	EPA 300.0 EPA 9056A	Sulfate
Ion Chromatrography	EPA 300.0 EPA 9056A	Ortho-phosph
Ion Chromatrography	EPA 300.0 EPA 9056A	Iodide
Ion Chromatrography	EPA 314.0	Perchlorate
Gravimetric	SM 2540B SM 2540C SM 2540D	Solids
Probe	EPA 9040C EPA 9045D EPA 150.1	pH
Titration	SM 2320B EPA 310.1	Alkalinity
Titration	EPA 9030	Sulfide
Penske-Martin	EPA 1010A	Ignitability
Colormetric	EPA 353.1	nitrate/Nitrite
Colormetric	EPA 350.1	Ammonia
TOC Analyzer	EPA 9060A	TOC
Colormetric	EPA 7196A	Hex Chromium

Solid and Chemical Materials

Technology	Method	Analyte
Gravimetric	EPA 1664A	Oil & Grease
Gravimetric	EPA 1664A	TPH
Probe	EPA 9050A	Conductivity
Gas Flow Proportional Counter	EPA 900.0 EPA 9310	gross alpha/beta
Gas Flow Proportional Counter	EPA 903.0 EPA 9315	Radium-226
Gas Flow Proportional Counter	EPA 903.0 EPA 9315	total radium
Gas Flow Proportional Counter	EPA 904.0 EPA 9320	Radium-228
Gas Flow Proportional Counter	EPA 905.0 / DOE HASL 300 Sr-02	Strontium-90
Liquid Scintillation Counter	EPA 906.0	Tritium
Liquid Scintillation Counter	Eichrom Technologies TCW01/TCS01	Tecnetium-99
Liquid Scintillation Counter	EERF C-01-C14	Carbon-14
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Gamma Emitters:
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Actinium 227 (assumes equilibrium w/ Th-227)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Actinium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Americium 241
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Antimony 124
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Antimony 125
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium-137
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium/Lanthanum-140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium 133
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Barium 140
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Beryllium 7
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 211 eq Th-227

Solid and Chemical Materials

Technology	Method	Analyte
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 207
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth-210M
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 212
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Bismuth 214
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Calcium-45
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 141
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 139
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cerium 144
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cesium 134
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cesium 137
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 56
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 57
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 58
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Cobalt 60
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 152
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 154
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Europium 155
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Hafnium 181
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iodine 131
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iridium 192
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Iron 59
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lanthanum 140

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 210
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 211
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 212
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Lead 214
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Manganese-56
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Manganese 54
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Mercury 203
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Neptunium 237
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Neptunium 239
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 83
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 94
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Niobium 95
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Potassium 40
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 144
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 146
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Promethium 147
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 234M
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 231
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Protactinium 234
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium (226)
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 223 (assumes equilibrium w/ Th-227)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Radium 224
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Ruthenium 106
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Scandium 46
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Sodium 22
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Sodium 24
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Strontium 85
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thallium 208
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 227
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 228
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 230
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 231
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 232
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Thorium 234
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Tin 113
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Uranium 235
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Uranium 238
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Vanadium-48
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Yttrium 88
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Zinc 65
Gamma Spectroscopy	EPA 901.1 / DOE HASL 300 Ga-01-R	Zirconium 95
Alpha Spectroscopy	DOE HASL 300 A-01-R	Alpha spec analysis:
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Uranium

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Thorium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Americium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Plutonium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Neptunium
Alpha Spectroscopy	DOE HASL 300 A-01-R	Isotopic Curium
Liquid Scintillation Counter	Eichrom Technologies OTW01, OTS01	Lead-210
Alpha Spectroscopy	Laboratory SOP ST-RC-0210	Polonium-210
Liquid Scintillation Counter	DOE RP-300	Nickel 59/63
Liquid Scintillation Counter	SM 7500-IB	Iodine-129
Preparation	**Method**	**Type**
Organic Extraction & Sample Prep	EPA 3500C	Organic Extraction & Sample Prep
Volatile Prep	EPA 5000	Sample Preparation for Volatile Organic Compounds
Organic Cleanup	EPA 3600A	Cleanup for Organic extracts
Organic prep/analysis	EPA 8000C	Determinative Chromatographic Separations
Acid Digestion (Aqueous samples)	EPA 3010A	Acid Digestion for Metals (Aqueous samples)
Acid Digestion (solids)	EPA 3050B	Acid Digestion for Metals of Sedimtent/Soils
Purge & Trap	EPA 5030C	Purge & Trap for Aqueous Volatile Samples
Closed System Purge & Trap and Extraction for Volatiles	EPA 5035A	Closed System Purge & Trap and Extraction for Volatiles
Sep Funnel Liquid-Liquid Extraction	EPA 3510C	Sep Funnel Liquid-Liquid Extraction
Ultrasonic Extraction	EPA 3550C	Ultrasonic Extraction Organic Soils
Solid Phase Extraction	EPA 3535A	Solid Phase Extraction
Acid Clean-up	EPA 3665A	Acid Clean Up for PCBs
Florisil Cleanup	EPA 3620C	Florisil Cleanup
Sulfur Cleanup	EPA 3660B	Sulfur Cleanup
Waste Dilution	EPA 3585	Waste Dilution Volatile Organics

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Solid and Chemical Materials		
Preparation	**Method**	**Type**
Waste Dilution	EPA 3580A	Waste Dilution SemiVolatile Organics
TCLP Extraction	EPA 1311	TCLP Extraction
SPLP Extraction	EPA 1312	SPLP Extraction
CWET Extraction	CA Title 22	CWET Extraction
Alkaline Digestion	EPA 3060A	Alkaline Digestion for Hexavalent Chromium

Notes:

1) This laboratory offers commercial testing service.

Approved by: ______________________ Date: April 6, 2016

R. Douglas Leonard
Chief Technical Officer

Re-Issued: 4/6/16

Appendix C
HPNS Basewide Stockpile Inventory
(as of September 21, 2017)

Basewide IR-02/Salvage Yard Stockpile Inventory as of September 21, 2017

Stockpile ID	Date Added to RCA	Location within RCA	Date Removed from RCA	Field Comments
520D oily soil/oily debris	4/20/2012	MDR		
B707 C1-D4	10/8/2010	Salvage Yard		
B707 C4-D1	10/8/2010	Salvage Yard		
B707 C4-D2	10/8/2010	Salvage Yard		
B708 D1	10/8/2010	Salvage Yard		
B707 C4-D4	10/8/2010	Salvage Yard		
Asphalt 500 SA, SU3-A1	2/8/2012	Salvage Yard		
Asphalt 500 SA, SU16	2/8/2012	Salvage Yard		
Asphalt 500 SA, SU15	2/8/2012	Salvage Yard		
Asphalt 79&80, SU1 A1	11/17/2011	Salvage Yard		
Asphalt 520 SA, SU5 A1	11/16/2011	Salvage Yard		
Asphalt B707 A6-D1, A5-D5, A7-D7, A6-D4, A5-D2, A6-D2	10/8/2010	Salvage Yard		
618	3/22/2012	MDR		
642	3/29/2012	MDR		
644	3/30/2012	MDR		
645	6/8/2012	MDR		
691	5/21/2012	MDR		
693	5/17/2012	MDR		
Concrete Grindings	8/17/12-9/20/2012	SB4		
Rebar, wire mesh, concrete debris	4/26/2014	SB4		
Asphalt Grindings	8/21/2014	SB4		
647	8/7/2012	SB4		
648	8/3/2012	SB4		
649	8/6/2012	SB4		
650	8/6/2012	SB4		
651	8/7/2012	SB4		
655	8/2/2012	SB4		
CTO 15 Soil	8/15/14 - 9/24/14	SB4		
Brick Grindings	9/20/2012	SB4		
BART Soil	4/20/2012	SB4		
6" drain rock	9/11/2014	SB4		
1.5" drain rock	8/26/2014	SB4		
1.5" drain rock	8/26/2014	SB4		
base rock	5/19/2014	SB4		
quarry fines	start 5/1/12	SB4		
Imported MD Soil	5/1/2006	IR-02 adjacent to Building 600		

Notes:

BART soil - import material from expansion of Bay Area Rapid Transit System

MD soil - Pennisula Mills import material

Appendix D
Contractor Quality Control Plan

Naval Facilities Engineering Command Southwest
San Diego, CA

Appendix D
Final
Contractor Quality Control Plan

Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

October 2017

APTM-0006-4550-0008

Naval Facilities Engineering Command Southwest
San Diego, CA

Appendix D
Final
Contractor Quality Control Plan

Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California

October 2017

Stephen Massey Program Quality Control Manager	October 23, 2017 Date
Lisa Bercik, PE, QSD, QSP Project Manager	October 23, 2017 Date

Prepared for NAVFAC Southwest by
Aptim Federal Services, LLC
4005 Port Chicago Highway, Suite 200
Concord, California 94520
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Table of Contents

Table of Contents (continued)

List of Attachments

Acronyms and Abbreviations

APP/SSHP	*Accident Prevention Plan/Site Safety and Health Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California*
AMS	*APTIM Management System*
APTIM	Aptim Federal Services, LLC
COR	Contracting Officer Representative
CQC	contractor quality control
CTO	contract task order
DFOW	definable feature of work
HPNS	Hunters Point Naval Shipyard
KO	Contracting Officer
Navy	U.S. Department of the Navy
PM	project manager
QC	quality control
QCD	quality control directive
RCT	radiological control technician
RPP	*Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California*
WP	work plan

1.0 Introduction

Aptim Federal Services, LLC (APTIM) prepared this Contractor Quality Control (CQC) Plan under Contract No. N62473-17-D-0006, Contract Task Order (CTO) N62473-17-F-4550 to describe the quality control (QC) actions that will be implemented during the basewide radiological support and stockpile characterization activities at Hunters Point Naval Shipyard (HPNS), San Francisco, California. This CQC Plan will be used in conjunction with the following:

- *Final Corporate Quality Management Plan, Contract N62473-17-D-0006, Environmental Multiple Award Contract for Remediation of Radiological Contaminants (RADMAC II)* (CB&I Federal Services LLC, 2017), which includes quality control directives (QCDs)
- *APTIM Management System* (AMS; APTIM, 2017a)

Radiological activities include gamma scan surveys and sampling of surface soil and soil/debris stockpiles, routine radiological compliance monitoring, air monitoring, and personnel exposure monitoring. Radiological work will be performed in accordance with U.S. Nuclear Regulatory Commission Radioactive Materials License 20-31340-01, and State of California Radioactive Materials License 7789-07 and associated procedures and work instructions. Radiological safety procedures and roles and responsibilities of the radiological organization are described in the *Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California* (RPP; APTIM, 2017b).

This project-specific CQC Plan was developed to ensure project activities are conducted in a planned and controlled manner, the product of these activities conforms to contract requirements, and appropriate documentation exists to support each activity for which APTIM is responsible.

A Project QC Manager will be present at the work site to implement and manage the QC Program. The Project QC Manager will work closely with the Project Manager (PM) and with the U.S. Department of the Navy (Navy) quality assurance representatives to assure that the work is performed in compliance with specifications contained in the approved work plan (WP) and this CQC Plan. The Project QC Manager has the authority to stop work if contract requirements are not being met. In the event that the Project QC Manager is unavailable, an alternate QC Manager will assume this responsibility.

The Program QC Manager for this Navy contract is responsible for developing, maintaining, and enforcing the QC Program for the contract, and will work directly with the PM and the Project QC Manager to assure that all work is performed in compliance with the contract. The Program

QC Manager will serve as an alternate contact for the Project QC Manager if questions arise regarding acceptability of materials or performance during the project.

The PM reports to the Program Manager for the contract, who has the responsibility and authority to ensure that the work is performed according to the approved specifications and to the Navy's satisfaction.

Attachment 1 depicts APTIM's project organization for this CTO. Attachments 2 through 9 are documents from the QCDs tailored to this CTO, which will help achieve statement CTO objectives. If additional project-specific quality procedures are required as the project progresses, these procedures will be inserted into Attachment 10.

2.0 Quality Control Organization

APTIM structured its corporate QC organization to support the Program Managers and PMs who have ultimate responsibility for the quality of services APTIM provides. The Program Managers and PMs are responsible for ensuring that personnel in their organizations understand the corporate and contract-specific QC programs and that their organizations' functions are set up and maintained effectively.

Quality issues are resolved at the lowest possible organizational level at each project site, to enable timely correction action development and implementation. Issues that cannot be satisfactorily resolved at the project level are elevated to and resolved at the corporate level.

APTIM's project organization chart, including QC personnel, is shown in Attachment 1. The figure illustrates the reporting and communication relationships between QC personnel, the APTIM field team, subcontractors, and Navy representatives. This structure provides the organizational freedom for personnel to identify and evaluate quality problems and discrepancies, provide recommended solutions, and ensure that appropriate corrective actions are taken.

The specific responsibilities and qualifications associated with each QC-related position are outlined in Attachment 2. The qualifications and experience of the proposed key appointees for this project are summarized in Attachments 3 and 4.

2.1 Quality Control Personnel and Qualifications

Key QC personnel for APTIM projects are assigned on the basis of appropriate experience and the determination that these individuals meet the contract and CTO-specific requirements. The Project QC Manager and Alternate Project QC Manager are appointed by the Program QC Manager. The following paragraphs identify the QC team for this CTO and highlight their responsibilities. Copies of appointees' resumes, certifications, and letters of designation are included in Attachments 3 and 4.

2.1.1 Project Quality Control Manager

The Project QC Manager, who reports directly to the Program QC Manager, will work closely with the PM, Radiation Safety Officer, Radiation Control Supervisor, and Navy QC representatives to assure that the work is performed in compliance with the specifications contained in the approved WP. The Project QC Manager has the authority to stop work if contract requirements are not being met. The Project QC Manager's responsibilities are listed in Attachment 2. In the event the Project QC Manager is unavailable, an Alternate Project QC Manager will assume this responsibility.

2.1.2 Alternate Project Quality Control Manager

In the event the Project QC Manager is unavailable, an Alternate Project QC Manager will assume the QC responsibilities outlined in Attachment 2 and described in this CQC Plan. The Alternate Project QC Managers designated for this project are identified in Attachment 4.

The project team, including subcontractors, will use procedures in this subsection to ensure quality and achieve project objectives.

2.2 Quality Control Directives

The following QCDs apply to this CTO:

- QCD 1.0, "Project Quality Control Personnel Duties, Qualifications, and Authority"
- QCD 2.0, "Project Quality Control Plans"
- QCD 3.0, "Design Review"
- QCD 4.0, "Coordination and Mutual Understanding Meeting"
- QCD 5.0, "Project Quality Control Meetings"
- QCD 6.0, "Submittals"
- QCD 7.0, "Documentation"
- QCD 8.0, "Quality Control Certifications"
- QCD 9.0, "Three Phases of Control"
- QCD 10.0, "Completion Inspections"
- QCD 11.0, "Testing"
- QCD 12.0, "Corrective Action Requests and Non-compliance"
- QCD 13.0, "Rework"
- QCD 14.0, "Change Control"
- QCD 15.0, "Organization and Personnel Certifications Log"
- QCD 16.0, "Field Startup"
- QCD 17.0, "PM Turnover"
- QCD 18.0, "Training"
- QCD 19.0 "Quality Audits"
- QCD 20.0 "Quality Control for Geophysical Surveys"

2.3 APTIM Quality Procedures

The following documents describe the administrative and technical requirements for uniform quality performance for this project. These procedures are developed, maintained, and hosted corporately within the AMS. Procedures can be accessed by any APTIM employee and will be provided to the government upon request (APTIM, 2017a).

- AMS-720-01-PR-00130, "Quality Management Organization" (supersedes EIP-Q-001, "Quality Organization")
- EIP-Q-002, "Stop Work Notice for Quality Related Issues" (no current AMS equivalent)
- AMS-720-01-PR-00120, "Project Quality Plans" (supersedes EIG-Q-003, "Project Quality Plan")
- AMS-720-02-PR-00480, "Receiving Inspection" (supersedes EIP-Q-004, "Receipt Inspection")
- AMS-720-01-PR-00230, "Construction Inspection Program" (supersedes EIP-Q-005, "Inspection")
- AMS-720-01-PR-00290, "Inspection and Test Plans" (supersedes EIP-Q-005, "Inspection" and EIP-Q-016, "Test Control")
- AMS-720-01-GL-00230, "Guidelines for Quality Surveillance Activities" (supersedes EIP-Q-006, "Surveillance")
- AMS-720-01-PR-00150, "Identification, Control, and Disposition of Nonconforming Product" (supersedes EIG-Q-007, "Nonconformance Reporting")
- AMS-720-01-PR-00170, "Corrective and Preventive Action" (supersedes EIG-Q-008, "Corrective Action")
- AMS-720-01-PR-00220, "Management System Audits" (supersedes EIG-Q-009, "Quality Audits")
- AMS-720-01-GL-00223, "Qualification and Assessment of Internal Audit Personnel" (supersedes EIP-Q-010, "Auditor and Lead Auditor Qualification Program")
- EIP-Q-014, "Management Assessment" (no current AMS equivalent)
- EIG-Q-015, "Quality Councils" (no current AMS equivalent)

Note: The QCDs take precedence over these procedures

3.0 Outside Organizations

To manage subcontractors and vendors effectively, APTIM carefully selects and prequalifies each firm. APTIM continuously and aggressively manages subcontractor costs, schedule, safety, and quality performance. The pre-qualification process ensures that subcontractors bring the same focus on quality, cost control, schedule discipline, and commitment to customer satisfaction as APTIM. Once an award is made to a subcontractor, APTIM manages the quality of the subcontractor's performance through the three-phase inspection process outlined in Section 9.0.

Laboratories providing environmental analyses are accredited as noted in Section 5.11 of the base contract (N62473-17-D-0006).

Names and qualifications of subcontractors proposed for this project are summarized in Attachment 5. Subcontractors will be subject to APTIM QC procedures. Testing and inspection procedures will be monitored by APTIM as described in Section 5.0.

4.0 Submittal Procedures

Submittals will be managed by APTIM as required by contract. The Project QC Manager will review and approve items prior to submittal. The Project QC Manager will certify that submittals are in compliance with contract requirements. Radiological data will be reviewed by the Project Radiation Safety Officer or designee prior to submittal. Submittals are further discussed under QCD 6.0.

5.0 Testing

In addition to implementing the three phases of the control system to ensure the overall quality of each definable feature of work (DFOW), APTIM will make use of formal testing procedures where applicable, including tests performed by subcontractors and/or off-site laboratories, to ensure conformance to applicable specifications and verify that control measures are adequate to provide a finished product which conforms to contract requirements. The Project QC Manager will ensure that sampling and testing are managed and performed as required by contract.

5.1 Testing Plan and Log

If necessary, the Project QC Manager will use the Testing Plan and Log, contained in Attachment 7, to manage project testing. As tests are performed, the Project QC Manager will record on the log the date the test was performed and the date the test results were forwarded to the Contracting Officer (KO) or Contracting Officer Representative (COR) as applicable. The Project QC Manager will attach a copy of the updated log to the last Daily Contractor QC Report of each month. Chemical or radiological sampling and analyses are normally not included in the log, since requirements are implemented by the Abbreviated Sampling and Analysis Plan (Appendix B of the WP).

5.2 Testing and Documentation

APTIM will submit test reports, containing test results to the KO and/or COR as required by contract. Test reports will cite applicable contract requirements, tests or analytical procedures used, and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, APTIM will notify the KO and/or COR immediately. APTIM will submit the signed test reports, certifications, and other documentation to the KO and/or COR via the Project QC Manager. The Project QC Manager shall submit a summary report of field tests in the Daily Contractor QC Report. Testing is further discussed under QCD 11.0.

6.0 Rework Items, Non-Compliances, and Corrective Action Requests

The Project QC Manager will review any instances where materials, equipment, or activities fail to meet the specified requirements, and will take appropriate action to prevent future occurrences.

6.1 Rework

A rework item is work that does not comply with the contract. There is no requirement to report a rework item that is corrected the same day it is discovered. All APTIM and subcontractor personnel will be responsible for identifying rework items and reporting them to the Project QC Manager. The Project QC Manager will coordinate with the Project Superintendent to ensure rework items are corrected in a timely manner. The Project QC Manager shall maintain a Rework Items List of work that does not comply with the contract, including those identified by the KO or his/her representative. The Project QC Manager will report identified and corrected items in the Daily Contractor QC Report and during Project QC Meetings and will attach a copy of the Rework Items List to the last Daily Contractor QC Report of each month. Rework items are further discussed under QCD 13.0.

6.2 Non-Compliances

The KO may also notify APTIM of any detected non-compliance with the contract. APTIM will take immediate corrective action after receipt of such notice. Such notice, when delivered to APTIM at the work site, shall be deemed sufficient for the purpose of notification. Non-compliances are further discussed under QCD 12.0.

6.3 Corrective Action Requests

APTIM will identify, track, and correct items, processes, and services that do not meet established requirements. Correction will focus on determining the cause of the deficiency and corrective actions will address the deficiency and prevent recurrence. Corrective Action Requests are further discussed under QCD 12.0.

6.4 Procedures for Tracking Laboratory Deficiencies

Laboratory testing requirements for radiological analyses and procedures for identifying and managing any deficiencies are addressed under the Abbreviated Sampling and Analysis Plan (Appendix B of the WP).

7.0 Documentation

A variety of documents will be developed at specified points or intervals during the course of this project to support the QC process. These items will be submitted to the government or maintained by APTIM and made available for review as required. QC-related project documentation may include:

- Testing plan and log
- Daily CQC reports
- Three-phase control inspection checklists (preparatory, initial, and follow-up)
- QC meeting minutes
- Rework items list
- Non-compliance/corrective action reports
- As-built drawings
- Material receipt inspections

Documentation is further discussed under QCD 7.0.

7.1 Daily Reports

APTIM shall submit reports for each day that work is performed as required by contract. Reports will be attached to the Daily Contractor QC Report. Reports may also be submitted on a weekly basis depending on the nature of work and with approval from the Navy. The reporting of work shall be identified by terminology consistent with the construction schedule. The "remarks" section of reports will include directions received, construction deficiencies and problems, QC problems, deviations from project plans, conflicts or errors in the drawings or specifications, field changes, instructions given and corrective actions taken, work progress and delays, safety hazards, meetings held, and visitors to the work site.

7.1.1 Daily Contractor Quality Control Report

The Project QC Manager is responsible for preparing and signing the Daily Contractor QC Report. Other QC, production, and health and safety documents may be attached to this report. The Project QC Manager will submit the report to the Navy by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

7.1.2 Daily Contractor Production Report

The Project Superintendent or designee is responsible for preparing and signing the Daily Contractor Production Report. The report will be attached to the Daily Contractor QC Report.

7.1.3 Quality Control Specialist Report

If a QC Specialist is assigned, he/she shall prepare, sign, and date a report for each day that work is performed in his/her area of responsibility. This report shall include the same documentation requirements as are submitted with the Daily Contractor QC Report.

7.2 Quality Control Meeting Minutes

After the start of construction, the Project QC Manager will commence holding weekly QC meetings with the Site Superintendent, QC staff, and Site Safety and Health Officer. The Navy Remedial Project Manager/COR, Caretaker Site Office, Resident Officer in Charge of Construction, and Radiological Affairs Support Office may also attend these meetings as required.

As a minimum, the following will be accomplished at each QC meeting as needed:

- Review the minutes of the previous meeting
- Review the status of work, inspections, testing, rework, and submittals
- Review the work, inspections, and testing to be accomplished in the next two weeks and documentation required
- Resolve QC, production, and safety concerns
- Address items that may require revising the project plans
- Review the accident prevention plan and/or activity hazard analyses as necessary
- Review environmental requirements and procedures as necessary
- Review the following, as applicable
  - Waste Management Plan
  - Radiological Protection Plan
  - Status of training completion and progress

The Project QC Manager will prepare the minutes of the meetings and provide a copy to the COR within two working days after the meeting.

7.3 Quality Control Validation

APTIM shall maintain files of original documents in a home office, including project documents. Copies of project documents will also be filed in the field office. Project files include, but are not limited to, inspection reports and checklists, Testing Plan and Log, Rework Items List, and punch lists. Reports are required from the QC Specialists (if assigned) for each day that work is performed in their area of responsibility. QC Specialist reports shall include the same documentation requirements as the Daily Contractor QC Report for their area of responsibility. QC Specialist reports are to be prepared, signed, and dated by the QC Specialists and shall be attached to the Daily Contractor QC Report prepared for the same day.

7.4 As-Built Drawings

The Project QC Manager shall ensure the as-built drawings are kept current on a daily basis and marked to show deviations from the contract drawings identified with the appropriate modifying documentation. The Project QC Manager or QC Specialist assigned to that area of responsibility shall initial each revision. Upon completion of work, the Project QC Manager will certify the drawings, attesting to their accuracy, and ensure that they are submitted to the CO per QCD 8.0.

8.0 Definable Features of Work

A DFOW is a representative portion of work that is separate and distinct from any other stage of work. Eight DFOWs have been identified for this project, as outlined in the following subsections and further described in the WP. Activities associated with the project will be conducted in accordance with the WP; Abbreviated Sampling and Analysis Plan (Appendix B of the WP); *Accident Prevention Plan/Site Safety and Health Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California* (APP/SSHP; APTIM, 2017c); and the RPP (APTIM, 2017b) for this project, which provide specific methods and requirements for implementation of the DFOWs.

8.1 Definable Feature of Work 1: Radiological Controls and Postings

APTIM will implement and maintain radiological controls for radiologically impacted areas that are not covered by an on-site radiological remediation contractor according to the current memorandum of understanding, which will be posted within the on-site trailer. Sites will be posted according to existing radiological conditions. Radiological postings will be placed and maintained every 15 meters along perimeter fencing for radiologically impacted sites. Postings and fencing will be inspected on a minimum quarterly basis. Additional fencing will be procured and set up as needed.

In addition, APTIM will maintain a basewide-tracking table of waste piles within the radiologically controlled areas and impacted areas at HPNS. The current version of the table (as of September 21, 2017) is provided as Appendix C. Information from other contractors performing radiological work at HPNS will be consolidated and updated on a regular basis. The radiological status of the waste piles will be verified at a minimum of every two weeks.

8.2 Definable Feature of Work 2: Radiological Surveys

Routine weekly, monthly, and quarterly surface surveys will be performed for those areas that are radiologically impacted at HPNS, but not currently controlled by another licensed radiological contractor. Surface surveys shall cover all radionuclides of concern for each site. Survey activities include dose monitoring, and the collection of swipe samples and static measurements. The main purpose of the surveys is to ensure that there is no change in dose reading at the perimeter that could negatively impact the public or environment and to ensure all security measures are in place. Routine surveys are discussed further in the Radiation Protection Plan (APTIM; 2017b). Routine surveys include building surfaces and land areas.

8.3 Definable Feature of Work 3: Radiological Support to Other Contractors

Radiological support and supervision of non-radiological contractors performing work in radiologically impacted areas will be provided by qualified APTIM radiological control technicians (RCTs). At a minimum, the support includes radiological training and escort into and out of an impacted area. The radiological technician assigned to this task must ensure all personnel entering and exiting the impacted areas are properly trained, briefed, supervised, and scanned for radiological contamination upon exiting the site per U.S. Nuclear Regulatory Committee/California license requirements. Additionally, if the contractor is performing intrusive work, surveys of equipment may be required during work efforts.

Prior to entry to an impacted area, APTIM will ensure non-radiological remediation contractors entering the area have the required dosimetry, have completed the radiological awareness briefing, and have been briefed on the requirements established in the radiological work permit in accordance with applicable standard operating procedures. Persons entering an impacted area will sign in and out on an access log and comply with requirements established in the radiological work permit. In addition, personnel exiting an impacted area will be subject to a personnel survey by an RCT.

APTIM will perform radiological sampling and laboratory analysis (as required) in the event that a non-radiological contractor has to perform intrusive activities in an impacted area.

8.4 Definable Feature of Work 4: Incoming and Outgoing Surveys

In support of other contractors, surveys are required for both incoming equipment brought to HPNS and outgoing equipment leaving radiologically impacted areas. During these survey activities, accessible surfaces will be surveyed for removable and fixed surface contamination and the results documented. An equipment tracking log will be maintained for equipment entering and exiting radiologically impacted areas.

8.5 Definable Feature of Work 5: Portal Monitor and Truck Wash

APTIM will maintain and operate a portal monitor and truck wash for incoming and outgoing trucks loaded with both radiologically and non-radiologically contaminated soils and debris. The purpose of the portal monitor scan is to prevent the inadvertent shipment of materials or equipment exhibiting elevated radiation levels on to or off of HPNS. Hand screening may be required in instances when the portal monitor malfunctions or is unavailable. Loads that fail the portal monitor or hand scan will be escorted by a RCT back to the contractor who generated the soil, or will be dumped and radiologically screened in a controlled area. Additionally, the Base Realignment and Closure Caretaker Site Office Activity point of contact, Navy Remedial Project Manager, and Radiological Affairs Support Office will be notified immediately (same day) if a load fails.

APTIM will maintain a truck wash during large scale hauling events. The truck wash will be operated in conjuncture with operation of the portal monitor and will help reduce truck track-out. If the truck wash is not operational or during periods of minimal waste hauling, truck tires may be hand-spray to remove dirt and dust instead.

8.6 Definable Feature of Work 6: Decontamination and Release of Equipment and Tools

Equipment and personnel exiting a work area will follow decontamination procedures presented in the APP/SSHP (APTIM, 2017c). Decontamination areas will be located near work boundary exits. The level of decontamination of equipment will be determined by the Site Health and Safety Officer and Project Radiation Safety Officer. The need for and degree of decontamination will be based on the characteristics of the material within the work area and the potential for transporting contaminants outside of the work area.

Equipment decontamination areas will be constructed by placing an impermeable surface (e.g., plastic sheeting) to catch material removed from equipment. At a minimum, equipment will be decontaminated by dry brushing. Dump trucks and haul trucks removing waste soils and materials from the site will proceed through the on-site truck wash prior to leaving the site.

9.0 Three Phases of Control

The Project QC Manager manages the three phases of control to adequately cover on-site and off-site DFOWs. The Project QC Manager may assign the Task Leader for DFOWs to other project personnel, including the Project Engineer, Project Geologist, Project Superintendent, QC Specialist, etc.

9.1 Preparatory Phase

The Project QC Manager shall notify the CO and/or COR, as applicable at least two work days, two weeks for off-site work, in advance of each preparatory phase meeting. The assigned lead shown on the project DFOW Matrix will conduct the meeting. At a minimum, the Project QC Manager, QC staff, Project Superintendent, foreman, and Site Safety and Health Officer will attend. When a subcontractor will perform work, that subcontractor's superintendent shall attend.

9.1.1 Preparatory Phase Activities

The following will occur during the preparatory phase:

- Review each paragraph of the applicable specification sections.
- Review the contract drawings.
- Verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders, in order to minimize waste due to excessive materials.
- Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.
- Review the Testing Plan and Log, and ensure that provisions have been made to provide the required QC testing.
- Examine the work area to ensure that the required preliminary work has been completed.
- Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- Examine the required materials, equipment, and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data.
- Discuss construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems.

- Review the APP/SSHP (APTIM; 2017c) and appropriate activity hazard analyses to ensure that applicable safety requirements are met and that required material safety data sheets are submitted.

Results of the preparatory phase will be documented in the Inspection Report and attached to the Daily Contractor QC Report.

9.2 Initial Phase

The Project QC Manager shall notify the KO and/or COR at least two work days, two weeks for off-site work, in advance of each initial phase. The assigned lead shown on the project DFOW Matrix will perform the initial phase and he/she will observe the initial segment of the DFOW to ensure that the work complies with contract requirements. Results of the initial phase will be documented in the Inspection Report and attached to the Daily Contractor QC Report. Attachments contain this report. The following will be performed:

- Establish the quality of workmanship required
- Resolve conflicts
- Ensure that testing is performed by the approved laboratory
- Check work procedures for compliance with the APP/SSHP (APTIM; 2017c) and the appropriate activity hazard analyses to ensure that applicable safety requirements are met

Results of the initial phase will be documented in the Inspection Report and attached to the Daily Contractor QC Report.

9.3 Follow-up Phase

The assigned lead shown on the project DFOW Matrix will perform the follow-up phase for ongoing work daily, or more frequently as necessary, until the completion of the work. Results of the initial phase will be documented in the Inspection Report and attached to the Daily Contractor QC Report. The following will be performed:

- Ensure the work is in compliance with contract requirements
- Maintain the quality of workmanship required
- Ensure that testing is performed by the approved laboratory
- Ensure that rework items are being corrected
- Perform safety inspections

9.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases will be conducted for a deficiency if the quality of ongoing work remains or becomes unacceptable; there are changes in the applicable QC organization; there are changes in the on-site production supervision or work crew; work is resumed after substantial period of inactivity; or other problems develop. The three phases of control are further discussed under QCD 9.0.

10.0 Completion Inspections

Project inspections that demonstrate completeness are described in this section. Inspections may include a punch-out inspection, pre-final inspection, and final acceptance inspection.

10.1 Punch-Out Inspection

The Project QC Manager will manage completion inspections. Near the completion of all work or to verify that statement of objectives or performance work statements are met, the Project QC Manager will ensure work is inspected and a punch list developed. Punch list items include items that do not conform to the approved drawings, specifications and contract, and remaining rework items. The punch list will indicate the estimated correction dates of these items. A copy of the punch list will be provided to the COR, if required by contract. The Project QC Manager will ensure corrected items are verified. Once this is accomplished, he/she will schedule a pre-final inspection.

10.2 Pre-Final Inspection

The Navy will perform a pre-final inspection to verify that fieldwork is complete. A Navy punch list may be developed as a result of this inspection. The Project QC Manager will ensure that the items on this list are corrected prior to notifying the Navy that a final inspection with the client can be scheduled. Any items noted during the preliminary-final inspection must be corrected in a timely manner and be accomplished before the contract completion date for the work.

10.3 Final Acceptance Inspection

If required by contract, the Project QC Manager will notify the KO and/or COR at least 14 calendar days prior to the date a final acceptance inspection can be held, stating that all items previously identified during the pre-final will be corrected and acceptable, along with any other unfinished contract work, by the date of the inspection. The Project QC Manager, Project Superintendent, and others deemed necessary will be present during the inspection with the Navy. If deficiencies remain or are identified during the inspection, the parties will agree on a course of action. Completion inspections are further discussed under QCD 10.0.

10.4 Inspection Documentation

Inspection records will be maintained by the Project QC Manager in accordance with QCD 7.0.

11.0 References

CB&I Federal Services LLC, *2017, Final Corporate Quality Management Plan, Contract N62473-17-D-0006, Environmental Multiple Award Contract for Remediation of Radiological Contaminants (RADMAC II)*, May.

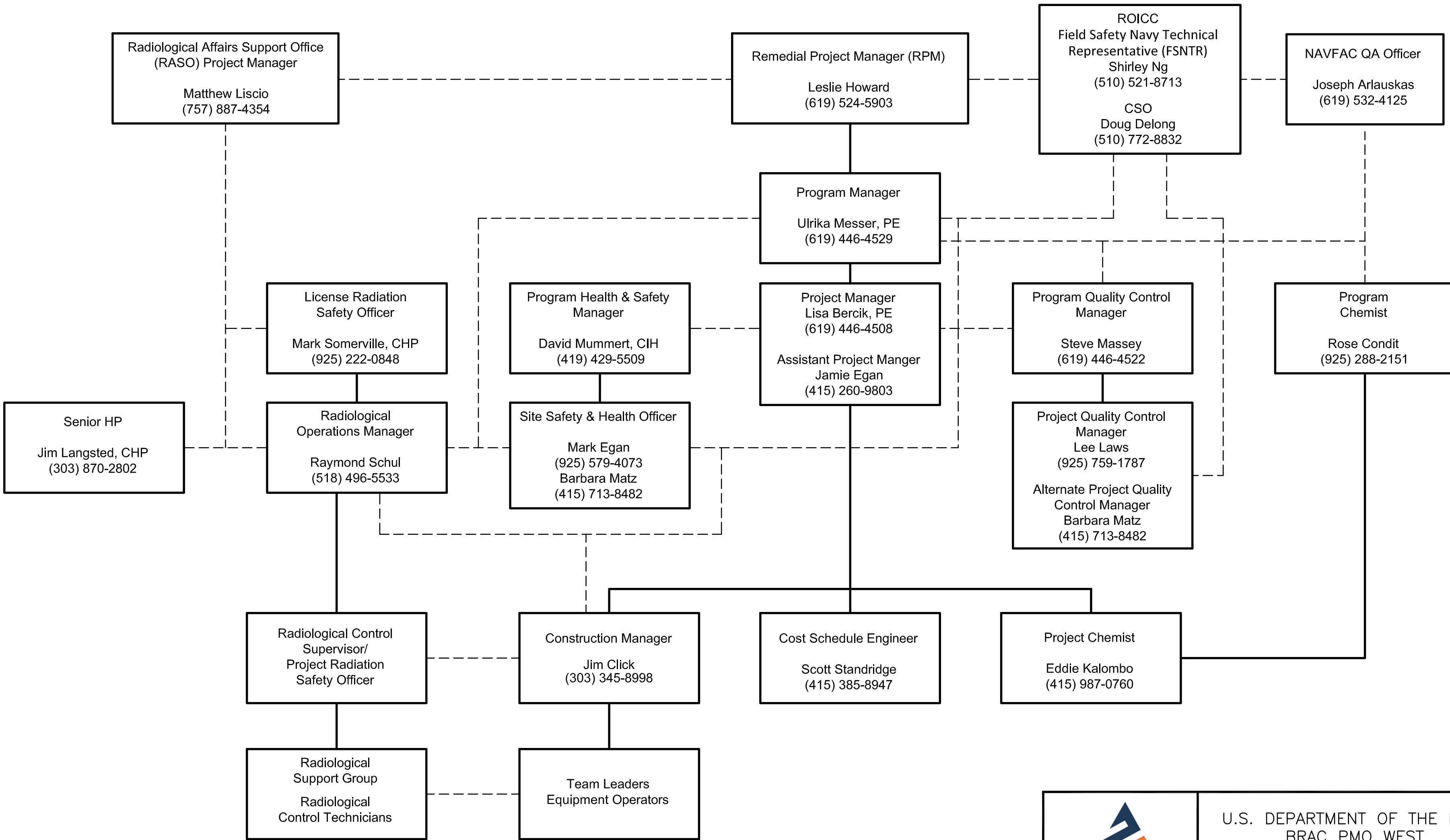
Aptim Federal Services, LLC (APTIM), 2017a, *APTIM Management System*.

APTIM, 2017b, *Radiation Protection Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California.*

APTIM, 2017c, *Accident Prevention Plan/Site Safety and Health Plan, Radiological Work Tasks, Remedial Action and Maintenance of Remedies at Hunters Point Naval Shipyard, San Francisco, California.*

Attachment 1
Quality Control Organization Chart

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	Concord	BLACK	9/26/17					501008-A1



LEGEND

- - - - - LINES OF COMMUNICATION

——— LINES OF AUTHORITY

APTIM

U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

ATTACHMENT 1
ORGANIZATION CHART

BASEWIDE RADIOLOGICAL SUPPORT
HUNTERS POINT NAVAL SHIPYARD
SAN FRANCISCO, CALIFORNIA

Attachment 2
Project Quality Control Duties and Responsibilities

Project Quality Control Duties and Responsibilities

Duty	Responsibility	QCD
Pre-Construction Phase		
Establish Personnel Requirements	PM	1.0
Review Personnel Resumes	PM	1.0
Assign Duties	PM	1.0, 2.0
Prepare Organization Chart	PQCM	1.0, 2.0
Prepare Letters of Designation	PQCM	1.0, 2.0
Review Plans and Designs	PM, PQCM	3.0, 7.0
Identify Subcontractors	PM	1.0, 2.0
Submit Laboratory Information	PQCM	1.0, 2.0
Attend Training	all	1.0
Prepare Submittal Register	PQCM	2.0, 6.0
Prepare Definable Features of Work Matrix	PQCM	2.0, 9.0
Prepare Testing Plan and Log	PQCM	2.0, 11.0
Prepare Rework Items List	PQCM	2.0, 13.0
Assemble Forms	PQCM	2.0
Assemble Personnel Certifications	PQCM	8.0, 15.0
Conduct Coordination and Mutual Understanding Meeting	PQCM	4.0
Construction Phase		
Ensure Construction Quality	PM	1.0, 14.0, 16.0, 17.0
Review Definable Features of Work	PQCM	9.0
Ensure Submittals Approved and Submitted	PQCM	3.0, 6.0, 7.0
Conduct Project QC Meetings	PQCM	5.0
Conduct Preparatory Meetings	PQCM	9.0
Conduct Preparatory Inspections	PQCM	9.0
Conduct Initial Inspections	PQCM	9.0
Conduct Follow-Up Inspections	PQCM	9.0
Conduct Completion Inspections	PQCM	10.0
Manage Corrective Action Requests	PQCM	12.0
Manage Rework Items	PQCM	13.0
Provide QC Certifications	PQCM	8.0

Notes:

The PQCM may assign the lead for inspections to the other project personnel: Task Lead, Project Site Superintendent, etc.

PM	*project manager*
PQCM	*project quality control manager*
QC	*quality control*
QCD	*quality control directive*

Attachment 3
Project Quality Control Manager Letter of Designation, Resume, and Construction Quality Management Training Certificate

CONTRACTOR QUALITY CONTROL PLAN
Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California
Contract Number N62473-17-D-0006
Contract Task Order N62473-17-F-4550

PROJECT QUALITY CONTROL MANAGER
LETTER OF DESIGNATION

October 24, 2017

Mr. Lee Laws:

This letter will serve to assign you as the Aptim Federal Services, LLC Project Quality Control (QC) Manager for the above-captioned contract task order. In this capacity, you will report directly to me and will administer the established requirements of the contract and Project QC Plan. In the case where you are not able to perform the Project QC Manager's duties, Mr. Mark Vennemeyer, Ms. Barbara Matz, Mr. Kevin O'Leary, Ms. Natalie Rothell, Mr. Michael Lightner, Ms. Amy Meldrum will serve as your Alternate Project QC Manager. You will manage the three phases of control. You are authorized to stop work that is not in accordance with the contract and will exercise this authority consistent with Aptim Federal Services, LLC policies and procedures. You are authorized to approve submittals that have been certified by qualified submittal reviewers as identified in the organization chart for this task order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work.

If you have any questions or require additional information, please contact me at 619.446.4552.

Sincerely,

Aptim Federal Services, LLC

Stephen P. Massey

Stephen Massey
Program QC Manager

Lee H. Laws

Professional Qualifications

Mr. Laws has more than 16 years of QA/QC experience with IT Corporation and The Shaw Group (May 2002 - Present), functioning since 1996, as Project QC Manager on the Navy EFA West Remedial Action Contract (RAC). This project experience has encompassed all phases of CERCLA Removal and Remedial Action cleanups, Superfund and National Priority List (NPL) sites, and numerous petroleum cleanups (e.g., USTs, ASTs) at federal facilities, industrial and residential properties under contracts from the U.S. Navy, U.S. Army Corps of Engineers (USACE), and U.S. Department of Energy (DOE).

Since 1999, Mr. Laws has served as the Lead QC Manager at Naval Station Treasure Island/Yerba Buena Island, which is a top priority Base Realignment and Closure (BRAC) base on the $250M Navy EFA West RAC. During this time period, the project backlog has grown to 16 environmental cleanup Contract Task Orders (CTO's 006, 012, 016, 036, 039, 040, 043, 045, 046, 089, 099, 102, 105, 106, 131, 134) with a total budget of over $37M, including a current backlog of over $20M. Treasure Island CERCLA, RCRA and petroleum cleanup projects have been executed with a high degree of involvement and oversight from the Navy, City of San Francisco, State and County regulatory agencies and local citizen groups who occupy the impacted property.

In support of this growing basewide cleanup program, Mr. Laws has prepared all CTO QC plans, provided ongoing project team and subcontractor coordination of task-specific QC inspections (including interface with two Government QA Resident Officers in Charge of Construction), and maintained all project QC documentation in a cost-effective MS-Access database. Mr. Laws produces project deliverables, including QC records and technical reports, in Adobe (pdf) format on CD-ROM, which substantially reduces project cost. Navy EFA West RAC six-month performance evaluations have consistently rated the Treasure Island QC Program "Level 1 - Outstanding," which has translated into an additional $1,664,316 of award fee profit (to-date) to IT Corporation and The Shaw Group

Education

High School Diploma, General Education, Pittsburg High Schol, Pittsburg, California, [redacted]

Additional Training/Continuing Education

USACE CQM Training, Sacramento, 2004
DHS Lead Supervisor/Monitor, UC Berkeley, 2000

Registrations/Certifications/Licenses

USACE Construction Quality Control Manager, 2004, Active, Nationwide, 11/2008

Experience and Background

05/2002 - Present
Project QC Manager, Shaw Environmental & Infrastructure, Inc., Quality, Concord, California

2002 - Present IT Corporation/Shaw Environmental & Infrastructure, Concord, California.
Project QC Manager on the Navy Engineering Field Activity (EFA) West, Remedial Action Contract (RAC)

Naval Station Treasure Island, San Francisco, California.

Currently serve as the Lead QC Manager. Responsible for the planning, development and project team implementation of Project QC Plans and documentation on 10 environmental cleanup contract task orders with a total budget of over $37M. Projects involve the design, construction, operation, optimization and maintenance of remediation action systems (e.g., Soil Vapor Extraction); soil sampling, analysis, excavation, treatment, transportation and disposal; and site restoration in sensitive public housing areas. Mr. Laws effectively plans, coordinates and verifies task-specific QC inspections with Task Leaders, the Site Health & Safety Officer, Navy Resident Officers in Charge of Construction (ROICCs) and subcontractors. Mr. Laws also performs independent quality assurance audits, surveillances, and inspections of laboratories and field project activities to verify compliance with established QA program requirements

10/1996 - 05/2002
Project QC Manager, IT Corporation, Martinez, California

1996 - 2002 IT Corporation/Shaw Environmental & Infrastructure, Concord, California.
Project QC Manager on the Navy Engineering Field Activity (EFA) West, Remedial Action Contract (RAC)

Naval Station Treasure Island, San Francisco, California.

Currently serve as the Lead QC Manager. Responsible for the planning, development and project team implementation of Project QC Plans and documentation on 10 environmental cleanup contract task orders with a total budget of over $37M. Projects involve the design, construction, operation, optimization and maintenance of remediation action systems (e.g., Soil Vapor Extraction); soil sampling, analysis, excavation, treatment, transportation and disposal; and site restoration in sensitive public housing areas. Mr. Laws effectively plans, coordinates and verifies task-specific QC inspections with Task Leaders, the Site Health & Safety Officer, Navy Resident Officers in Charge of Construction (ROICCs) and subcontractors. Mr. Laws also performs independent quality assurance audits, surveillances, and inspections of laboratories and field project activities to verify compliance with established QA program requirements.

China Lake Naval Air Weapons Station, Ridgecrest, California.
Served as the Project QC Manager. Responsible for the implementation of the site specific work plans and the quality control plans. Also responsible for daily field inspections to ensure that all work was performed in accordance with the work plan, specifications and requirements based on the program contract. Responsibilities also included performing reviews of documentation and the preparation of daily CQC reports that were submitted to the Navy on the next business morning.

Naval Communication Station, Stockton, California.
Served as the Site Health and Safety Officer. Responsible for providing independent surveillance of the routine implementation of the site safety and health plan. Conducted daily Tailgate Safety Meetings, verified personnel had necessary training and medical clearance to enter work area, performed daily equipment calibrations, monitored personnel for compliance with site safety and health plans, and performed monthly safety inspections.

Yerba Buena Island Housing, Yerba Buena, California.
Served as the Project QC Manager for Lead Base Paint Abatement. Responsible for the implementation of the site specific work plans and the quality control plans. Also responsible for daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements based on the program contract. Responsibilities included performing reviews of documentation and the preparation of daily CQC reports, which were submitted to the Navy on the next business morning.

Alameda Naval air Station, Alameda, California.
Served as the Project QC Manager and Site Superintendent. Responsibilities included implementation of the site specific work and quality control plans. Also responsible for daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements based on the program contract. Also performed reviews of documentation and prepared daily CQC reports, which were submitted to the Navy on the next business morning. My responsibilities as Site Superintendent included daily production, scheduling activities, ordering equipment and site safety.

Department of Defense Housing, Novato, California.
Served as the Project QC Manager. Responsible for the implementation of the site specific work and quality control plans, as well as daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements based on the program contract. Responsibilities included performing reviews of documentation and the preparation of daily CQC reports that were submitted to the Navy on the next business morning.

Naval Medical Center, Oakland, California.
Served as the Project QC Manager. Responsible for the implementation of the site specific work and quality control plans in addition to daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements, which were based on the program contract. Responsibilities included performing reviews of documentation and the preparation of daily CQC reports which were submitted to the Navy on the next business

08/1995 - 10/1996
Quality Control Coordinator, IT Corporation, San Jose, California

1995 - 1996 IT Corporation, San Jose, California
Quality Control Coordinator, Engineers Services
Responsible for field QC activities, ensuring that fieldwork was being performed in accordance with the requirements written in the project work plans and procedures. Specific project experience and responsibilities included:

Hamilton Army Air Field, Novato, California.
Served as a Quality Control Inspector for the QC group. Responsible for daily field inspections and the preparation of daily QC reports. Performed reviews of documentation and other duties designated by the Program QC Manager.

07/1993 - 08/1995
Field Analytical Specialist II, IT Corporation, Field Analytical Services, Martines, California

1993 - 1995 IT Corporation, Martinez, California
Field Analytical Specialist II, Field Analytical and Sampling (FAS)
Responsible for organizing and participating in field analytical and sampling activities. Ensured sample protocols were followed, and coordinated between field and laboratory to meet project needs. Specific project experience and responsibilities included the following:

IBM, San Jose, California.
Served as a "lead man" for a demolition crew of three to six employees. Responsible for guidance and inspection of crew?s work. Insured health and safety around work area.

MCAGCC, Twenty Nine Palms, California.
Served as the sample coordinator working with the Jacobs Engineers Group Navy/Clean program at this DOE Superfund site. Acted as Liaison between the field and the laboratory: ordering glassware, coordinating sampling, documenting sampling, and maintaining the field database.

03/1989 - 07/1993
Assistant Field Analytical Specialist, IT Corporation, Martinez, California

1989 - 1993 IT Corporation, Martinez, California
Assistant Field Analytical Specialist, Field Analytical and Sampling (FAS)
Responsible for environmental monitoring on various RI/FS projects in the Western United States. Primary responsibilities were groundwater compliance, soil organic vapor sampling, and soil sampling. Some specific experience include the following:

Mather Air Force Base, Rancho Cordova, California.
Served as a sample team leader in the areas of SOV, soil, and groundwater sample collection. Trained new employees in proper sampling and documentation procedures. Responsible for providing instruction and performing tasks in the areas of monitoring well development, dedicated pump and packer installation, and proper operation of such equipment. Gained experience with sample collection around drill rigs and a clearance for work on military flight lines. Acted as liaison between the field and analytical laboratory. Fulfilled the Sample Coordinator's position in his absence.

Castle Air Force Base, Merced, California.
Served as Assistant Sample Coordina¬tor during this major RI/FS project. Acted as liaison between the field operations and the office. Helped supervise the groundwater sampling and pump installation phases of the project.

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

LEE LAWS

#SPK511400875

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

SACRAMENTO, CA	7/17-7/18/14	SACRAMENTO/SPK	DREW A. PERRY
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
DREW A. PERRY	DREW.A.PERRY@USACE.ARMY.MIL	(916) 557-7779	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature
			Jeffrey J. Dziedzic
			Chief, USACE Learning Center

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: https://www.myuln.net

Attachment 4
Alternate Project Quality Control Manager Letter of Designation, Resume, and Construction Quality Management Training Certificate

CONTRACTOR QUALITY CONTROL PLAN
Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California
Contract Number N62473 17 D 0006
Contract Task Order N62473-17-F-4550

ALTERNATE PROJECT QUALITY CONTROL MANAGER
LETTER OF DESIGNATION

October 24, 2017

Mr. Mark Vennemeyer, Ms. Barbara Matz, Mr. Kevin O'Leary, Ms. Natalie Rothell, Mr. Michael Lightner, Ms. Amy Meldrum:

This letter will serve to assign you as Aptim Federal Services, LLC Alternate Project Quality Control (QC) Manager for the above-captioned contract task order. In the case where the designated Project QC Manager, Mr. Lee Laws is unable to perform the Project QC Manager's duties, you will serve in that capacity with his responsibilities and authorities, report directly to me, and administer the established requirements of the contract and Project QC Plan. You will manage the three phases of control. You are authorized to stop work that is not in accordance with the contract and will exercise this authority consistent with Aptim Federal Services, LLC policies and procedures. You are granted the authority to approve submittals that have been certified by qualified submittal reviewers as identified in the organization chart for this task order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work. You are authorized to act as an alternate for two weeks at one time and not more than 30 workdays during a calendar year. In the case where it is believed that these time periods will be exceeded, you must notify me.

If you have any questions or require additional information, please contact me at 619.446.4552.

Sincerely,

Aptim Federal Services, LLC

Stephen Massey
Program QC Manager

Last Updated: 03 Oct 2014

Mark J. Vennemeyer

Professional Qualifications

Mr. Vennemeyer has performed waste management activities for twenty-two(22) years for a variety of private and government clients. For the past 10 years, he also serves as a Construction Quality Control Manager and Site Health and Safety Officer in addition to Transportation and Disposal Coordinator for Shaw's Government Services division in California. He is responsible for ensuring quality standards of workmanship on various remediation projects, inspection of activities and adherence with contractual requirements, safety of workers, compliance with regular training and medical oversight, waste characterization/classification, regulatory oversight, providing technical assistance in matters of Waste Transportation and Disposal Subcontracts, waste sampling, coordination and management of resources necessary to perform off-site transportation and disposal, preparation of waste profiles and shipping papers, and tracking waste shipments to ensure compliance with all applicable regulations.
Mr. Vennemeyer is experienced in "unknown" identification, Treatment Technology requirements, Federal and State (California) waste regulations, and database management. He has great familiarity with CB&I's Safety policies and capability to identify and implement safe work practices in the field.

Education

Bachelor of Science, Chemistry, University of California, Irvine, Irvine, California, [redacted]

Additional Training/Continuing Education

Shipping Hazardous Materials, San Jose, CA, 2014
SARA-OSHA 8-hour refresher, Online, 2014
First Aid / CPR, Concord, CA, 2012
OSHA 30 Hour Construction Safety, On-line, 2010
Construction Quality Management for Contractors, Concord, CA, 2010
Site Safety Officer, Irvine, CA, 2006
IATA Dangerous Goods Shipment, Emeryville, CA, 2004
Hazardous Waste Manifesting, Alameda, CA, 2002
Cyanide Training, Richmond, CA, 1998
Hazardous Waste Supervisor, Richmond, CA, 1998
Hazard Categorization, San Jose, CA, 1995
Emergency Response Training, San Jose, CA, 1995
Radiation Worker 2, Lawrence Livermore National Lab, 1994
40-Hour Hazardous Waste Operations, Sacramento, CA, 1992

Experience and Background

11/2011 - Present
QC Manager / Site Safety and Health Officer, CB&I Federal Services, San Francisco, California

QC manager and Safety officer for several large remedial projects at former Hunters Point Naval shipyard in San Francisco.
Operations included Radiological investigation and remediation; Soil Excavation and backfill; SVE System installation; Zero-valent iron and Bio-substrate Injection; Sampling and Analysis; Munitions investigation.
No lost-time incidents occurred during the project execution.

06/2007 - 10/2011
Quality Control Manager / Site Health and Safety Officer, Shaw Environmental & Infrastructure, Inc., Government Services, Alameda, California

Quality Control manager and Site Safety officer at the Alameda Point project(s). Pojects included contruction of in-situ Remediation systems (DVE for petroleum contamination, 6-phase underground heating for DNAPL plume).

The following is a summary of key projects:
Health & Safety / Quality control, Tank Closure Work / InSitu Treatability Study; Concord NWS, 140389, US Navy, Concord Naval Weapon Station, Concord, CA, 03/2011 - Present
2 Projects: #1 is a Treatability Study using injection to perform bioaugmentation and In-Situ treatment of chlorinated compounds. Site characterization and installation of monitoring wells was also preformed. A Solar-powered SVE system will be used to further remediate the site.
#2 was a project to remove five (5) underground fuel tanks from the former Base gas station. All tanks had been cleaned by a previous contractor, Shaw was responsible for the removal of tanks and associated piping as well as backfill / restoration of site.

Accomplishments:
Work performed with no lost-time incidents and successful coordination between base personnel, subcontractors and Shaw staff.

QC & H&S, Moffett Field, 133816, US Navy, Moffett Field, Mountain View, CA, 05/2009 - Present
Site characterization and chemical / biological injection for treatment of chlorinated solvent contamination at 2 sites on Moffett Field. Installation of Monitoring wells, chemical injection and periodic groundwater monitoring are tasks under this job.

Accomplishments:
none

04/2006 - 06/2007
Quality Control Manager, Shaw Environmental & Infrastructure, Inc., Government Services, San Francicso, California

Served as Quality Control Manager and T&D Coordinator at former Treasure Island naval base. Acted as liaison between Navy construction personnel (engineers, Construction technicians) and Shaw. Provided daily reporting and documentation of activities performed each day.

12/2005 - 04/2006
Quality Control Manager / Inspector, Shaw Environmental & Infrastructure, Inc., Government Services, San Diego, California

Worked with operations personnel to establish QC procedures and documentation of Navy owned Treatment, Storage and Disposal facility. Inspection of satellite facility(ies) for compliance to Navy and regulatory requirements.

02/2005 - 11/2005
Construction Quality Control Manager, Shaw Environmental & Infrastructure, Inc., Government Services, Concord, California

Responsibilities include support of client projects as quality control manager. Also responsible for interaction with client's technical representatives, preparing portions of reports, oversight of field work, inspection of materials and work performed.

The following is a summary of key projects:
<u>CQC Manager / SSHO, In-situ Treatability Study, 133816, US Navy, Moffett Federal Airfield, CA, 05/2009 - present</u>
Treatability study for the in-situ remediation of chlorinated solvents. Injection of three (3) separate treatment compounds in distinct areas was done with a quarterly groundwater monitoring program to measure results.

Accomplishments:
All work accomplished with zero lost time incidents

Other Comments:
Additional work was awarded as followup to the initial activities.

<u>QA Inspector, New York City Rapid Repairs Program, 148103, New York City Housing Authority, New York City, New York, $40,000,000.00, 01/2013 - 02/2013</u>
Performed Construction Quality Oversight on work completed by city contractors. Work reviewed included temporary repair of homes damaged by Superstorm Sandy, replacement of water damaged electrical systems, home heating (boiler/furnace) and hot water. Verify and quantify work completed as part of project closeout.

<u>Quality Control Manager / Alternate Site Safety & Health Officer, Hunters Point Shipyard, various, US Navy - BRAC-PMO-W, Hunters Point, San Francisco, CA, $23,000,000.00, 11/2011 - 11/2012</u>
Multiple projects were simultaneously performed at Hunters Point Shipyard. These projects included the Remediation of soils contaminated with Polychlorinated Biphenyls (PCBs), removal of sanitary sewers and storm drain utilities contaminated with radiological hazards, investigation of chlorinated compounds in groundwater, and removal action for a potentially radiologically impacted site.

Accomplishments:
Zero Lost Time during project.

Awards/Client Commendations:
1000 day President's Safety Award.

05/2002 - 02/2005
Transportation and Disposal Coordinator, Shaw Environmental & Infrastructure, Inc., Government Technical Services, Concord, California

Responsibilities include providing technical support for clients as a transportation and disposal coordinator. Also responsible for waste characterization, profiling, manifesting, coordination of subcontractors and disposal facilties for remedial actions, waste tracking and technical documentation of removal / disposal actions.

The following is a summary of key projects:
T&D Coordinator, Carmel Valley Manor, , JM Electric, Carmel, CA, $20,000.00, 03/2005 - 03/2005
Removal and disposal of aged transformers and electrical equipment. Tasks included sampling, characterizing, profiling, manifesting, packaging of equipment according to all applicable federal, state and local regulations.

Transportation and Disposal Coordinator, Hunters Point Shipyard, various, U.S. Navy, San Francisco, CA, 02/2002 - 02/2005
Transport and Disposal Coordinator for various projects at Hunters Point. Responsible for waste sampling, characterization, profiling, manifesting, coordination of waste shipments and technical documentation of disposal activities.
During the span of the project, over 20,000 tons of waste was removed from site and sent to various permitted treatment/disposal facilties.

Transportation and Disposal Coordinator, Alameda Point, former Alameda Naval Air Station, various, U.S. Navy, Alameda, CA, 02/2002 - 02/2005
Coordination of disposal activities for various remedial projects at the Former Alameda Naval Air Station. Tasks included Investigation Derived and Treatment by-product Waste sampling, characterization, profiling, manifesting and coordination of disposal.

Awards/Client Commendations:
President's Safety Award

Transport and Disposal Coordinator, ORC - Cyril, 100735, US EPA, Cyril, OK, $6,000,000.00, 09/2003 - 06/2004
Demolition of a shut-down oil refinery. Disposal of all wastes associated with the facility including petroleum by-products, chemical catalysts, construction demolition debris, abandoned drummed wastes and "laboratory size" chemical bottles.
Much of the structure was recycled as scrap metal, but the area was cleared of Asbestos prior to any demolition activites starting.

Transport and Disposal Coordinator, Hamilton Army Airfield, US Army Corp of Engineers, Novato, CA, 05/2002 - 12/2002
This project was the removal from site and disposal of several thousand tons of waste excavated soil that was staged on site at an Army Airfield that was in closure. Tasks included classification of waste based on analytical results of samples, profiling of waste to seleceted TSDFs, tracking of waste shipments (using the manifest shipping documents) and confirmation of costs associated with transportation and disposal of waste.

12/2000 - 02/2002
Transportation and Disposal Coordinator, IT Corporation (The Shaw Group Inc. acquired substantially all of the operating assets of The IT Group, Inc., on May 23, 2002), Government Services, Concord, California

Responsibilities included providing technical support to client projects as Transport and Disposal coordinator. Also responsible for field support of waste disposal operations, support of business development activities and composition of certain technical sections of reporting documents.

Mark J. Vennemeyer

Title: Scientist 3
Employee Number: [redacted]
Location: Concord, CA
Location2:
Business Unit: QA/QC, Field
Company: CBI Federal Services

Contact Information

Work Phone: 925-288-2383
Cell Phone: 925.383.6502

Skills

Group: ACCESS AUTHORIZATION
Category: SECURITY
Skill/Experience Level: Internet: Fundamental Knowledge
Skill/Experience Level: Microsoft Acrobat: Fundamental Knowledge
Skill/Experience Level: Microsoft Excel: Fundamental Knowledge
Skill/Experience Level: Microsoft Word: Fundamental Knowledge

Group: BUSINESS ADMINISTRATION SPECIALTIES
Category: EXECUTIVE MANAGEMENT
Skill/Experience Level: Corporate Policies & Procedures Administration: Fundamental Knowledge
Skill/Experience Level: Project Management: Fundamental Knowledge
Category: LEGAL
Skill/Experience Level: Environmental Law : Working Knowledge
Category: PROPOSALS
Skill/Experience Level: Letter Proposals : Fundamental Knowledge
Skill/Experience Level: Project Descriptions : Fundamental Knowledge
Skill/Experience Level: Resumes : Fundamental Knowledge
Skill/Experience Level: Scope of Work Analysis : Fundamental Knowledge
Skill/Experience Level: Technical Writing : Fundamental Knowledge

Group: COMPUTER/INFORMATION TECHNOLOGY SPECIALTIES
Category: COMPUTER APPLICATIONS (User)
Skill/Experience Level: Adobe Acrobat : Working Knowledge
Skill/Experience Level: DOS : Fundamental Knowledge
Skill/Experience Level: Internet : Working Knowledge
Skill/Experience Level: Lotus 1-2-3 : Fundamental Knowledge
Skill/Experience Level: ManageIT : Working Knowledge
Skill/Experience Level: Microsoft Access : Fundamental Knowledge
Skill/Experience Level: Microsoft Excel : Senior
Skill/Experience Level: Microsoft Power Point : Working Knowledge
Skill/Experience Level: Microsoft Word : Senior
Skill/Experience Level: Win 95 : Fundamental Knowledge
Skill/Experience Level: Windows 3.x : Fundamental Knowledge
Skill/Experience Level: Windows 98 : Fundamental Knowledge

Skill/Experience Level: Windows Vista: Working Knowledge
Skill/Experience Level: Windows XP : Working Knowledge
Skill/Experience Level: WordPerfect for Windows : Fundamental Knowledge
Category: COMPUTER/GENERAL
Skill/Experience Level: Computers (desktops/laptops) : Working Knowledge
Skill/Experience Level: Local Area Networks : Fundamental Knowledge
Skill/Experience Level: Peripherals : Fundamental Knowledge

Group: CONSTRUCTION/REMEDIATION SPECIALTIES
Category: CONSTRUCTION/REMEDIATION
Skill/Experience Level: Backfilling : Working Knowledge
Skill/Experience Level: Compaction : Working Knowledge
Skill/Experience Level: Concrete : Fundamental Knowledge
Skill/Experience Level: Construction Management : Fundamental Knowledge
Skill/Experience Level: Demolition : Fundamental Knowledge
Skill/Experience Level: Excavation : Working Knowledge
Skill/Experience Level: Field Inspection : Working Knowledge
Skill/Experience Level: General Construction : Fundamental Knowledge
Skill/Experience Level: Lead-Based Paint Abatement : Fundamental Knowledge
Skill/Experience Level: MTBE : Fundamental Knowledge
Skill/Experience Level: Operation/Maintenance : Fundamental Knowledge
Skill/Experience Level: Oversight : Fundamental Knowledge
Skill/Experience Level: Piping : Fundamental Knowledge
Skill/Experience Level: Site Remediation : Working Knowledge
Skill/Experience Level: Soil Handling/Testing : Fundamental Knowledge
Skill/Experience Level: Stabilization : Fundamental Knowledge
Skill/Experience Level: System Dismantling : Fundamental Knowledge
Skill/Experience Level: Transportation and Disposal : Expert
Skill/Experience Level: Trenching : Fundamental Knowledge
Category: GENERAL/SKILLED LABOR
Skill/Experience Level: Carpentry : Fundamental Knowledge
Skill/Experience Level: Concrete Finishing : Fundamental Knowledge
Skill/Experience Level: Pipe Fitting : Fundamental Knowledge
Skill/Experience Level: Trenching : Fundamental Knowledge
Skill/Experience Level: Welding : Fundamental Knowledge

Group: CONSULTING SPECIALTIES
Category: ASSESSMENT/EVALUATION
Skill/Experience Level: Radiological Surveys : Fundamental Knowledge
Skill/Experience Level: RCRA Facility Assessment : Fundamental Knowledge
Skill/Experience Level: Waste Characterization : Expert
Category: AUDITS
Skill/Experience Level: Compliance : Fundamental Knowledge
Skill/Experience Level: Environmental : Fundamental Knowledge
Skill/Experience Level: Health & Safety : Senior
Skill/Experience Level: Protocol Development : Fundamental Knowledge
Skill/Experience Level: Quality Assurance : Fundamental Knowledge
Category: CONSULTING
Skill/Experience Level: EH&S Management : Fundamental Knowledge
Category: HOMELAND SECURITY
Skill/Experience Level: Contaminated Waste Disposal : Senior

Skill/Experience Level: Debris and Waste Management : Working Knowledge
Skill/Experience Level: Hazardous Substance Characterization : Senior
Category: LAND PLANNING
Skill/Experience Level: Regulatory Compliance : Working Knowledge
Category: OUTSOURCING/PRIVATIZATION
Skill/Experience Level: Construction Management : Fundamental Knowledge
Category: TRAINING (Provided to Client)
Skill/Experience Level: Asbestos Abatement : Fundamental Knowledge
Skill/Experience Level: Emergency Response to Hazardous Substance Releases : Working Knowledge
Skill/Experience Level: Environmental Regulations Course : Working Knowledge
Skill/Experience Level: Government Compliance : Fundamental Knowledge
Skill/Experience Level: Hazard Communication : Working Knowledge
Skill/Experience Level: Hazardous Waste Operations : Senior
Skill/Experience Level: Health and Safety Courses and Seminars : Fundamental Knowledge
Skill/Experience Level: Operations : Fundamental Knowledge
Skill/Experience Level: Project Management : Fundamental Knowledge
Skill/Experience Level: Quality Assurance/Quality Control : Fundamental Knowledge
Skill/Experience Level: RCRA Site-Specific Course : Fundamental Knowledge
Skill/Experience Level: Regulatory : Working Knowledge
Skill/Experience Level: Specific Chemical Hazards : Fundamental Knowledge
Skill/Experience Level: Total Quality Management : Fundamental Knowledge

Group: ENERGY DELIVERY SERVICES
Category: EQUIPMENT OPERATED
Skill/Experience Level: Air Compressor: Fundamental Knowledge
Skill/Experience Level: Articulated Truck: Fundamental Knowledge
Skill/Experience Level: Backhoe: Fundamental Knowledge
Skill/Experience Level: Backhoe/Excavator: Fundamental Knowledge
Skill/Experience Level: Bobcat: Fundamental Knowledge
Skill/Experience Level: CAT 320 Excavator: Fundamental Knowledge
Skill/Experience Level: Dozer/Loader: Fundamental Knowledge
Skill/Experience Level: Drill Rig: Fundamental Knowledge
Skill/Experience Level: Fork Lift: Working Knowledge
Skill/Experience Level: Front End Loader: Fundamental Knowledge
Skill/Experience Level: Jack Hammer: Fundamental Knowledge
Skill/Experience Level: Man Lifts: Fundamental Knowledge
Skill/Experience Level: Skid Steer: Fundamental Knowledge
Skill/Experience Level: Truck (Fundamental Knowledge
Skill/Experience Level: Vac Truck: Fundamental Knowledge

Group: ENVIRONMENTAL SPECIALTIES
Category: AIR
Skill/Experience Level: Perimeter Monitoring : Fundamental Knowledge
Category: ANALYTICAL
Skill/Experience Level: Data Validation : Fundamental Knowledge
Skill/Experience Level: Field Analytical Methods : Working Knowledge
Skill/Experience Level: Geotechnical Testing : Fundamental Knowledge
Skill/Experience Level: Laboratory Analytical Methods : Working Knowledge
Skill/Experience Level: X-ray Fluorescence (XRF): Fundamental Knowledge
Category: REGULATORY

Skill/Experience Level: Analysis : Fundamental Knowledge
Skill/Experience Level: CERCLA : Working Knowledge
Skill/Experience Level: Code of Federal Regulations : Senior
Skill/Experience Level: Compliance : Fundamental Knowledge
Skill/Experience Level: Emergency Response: Fundamental Knowledge
Skill/Experience Level: Hazardous Waste Evaluation : Senior
Skill/Experience Level: RCRA Compliance : Working Knowledge
Skill/Experience Level: TSCA : Working Knowledge
Category: WASTE MINIMIZATION/POLLUTION PREVENTION
Skill/Experience Level: Recycling : Fundamental Knowledge
Skill/Experience Level: Waste Minimization/Pollution Control : Fundamental Knowledge

Group: FACILITY MANAGEMENT-SRM/MISSION SUPPORT SERVICES
Category: BUSINESS OPERATIONS
Skill/Experience Level: Administration : Fundamental Knowledge
Skill/Experience Level: Procurement : Fundamental Knowledge
Skill/Experience Level: Property Management : Fundamental Knowledge
Skill/Experience Level: Quality Control : Senior
Skill/Experience Level: Safety Management : Senior
Category: ENVIRONMENTAL SERVICES
Skill/Experience Level: Bilge & Oily Waste Treatment Plant O&M : Fundamental Knowledge
Skill/Experience Level: Hazardous Waste Handling, Storage & Disposal : Expert
Skill/Experience Level: Laboratory Services : Fundamental Knowledge
Category: JOC/IDIQ/SUSTAINABILITY, RELIABILITY, MAINTENANCE (SRM) CONSTRUCTION
Skill/Experience Level: Construction Management : Fundamental Knowledge
Skill/Experience Level: Project Management : Fundamental Knowledge
Skill/Experience Level: Quality Control : Working Knowledge
Skill/Experience Level: Superintendent : Fundamental Knowledge
Category: LOGISTICS
Skill/Experience Level: Shipping & Packing : Fundamental Knowledge
Skill/Experience Level: Warehouse Operations : Fundamental Knowledge
Category: ROADS & GROUNDS SERVICES
Skill/Experience Level: Erosion Control : Fundamental Knowledge
Category: VEHICLE/EQUIPMENT O&M
Skill/Experience Level: Equipment Operations : Fundamental Knowledge
Skill/Experience Level: Vehicle Operations : Fundamental Knowledge

Group: FIELD SERVICES SPECIALTIES
Category: ABOVEGROUND STORAGE TANKS
Skill/Experience Level: Aboveground Storage Tanks : Fundamental Knowledge
Skill/Experience Level: Cleaning : Fundamental Knowledge
Skill/Experience Level: Removal : Fundamental Knowledge
Category: ASBESTOS
Skill/Experience Level: Abatement : Fundamental Knowledge
Skill/Experience Level: Asbestos : Fundamental Knowledge
Category: DRILLING
Skill/Experience Level: Borings : Working Knowledge
Skill/Experience Level: Drilling : Working Knowledge
Skill/Experience Level: Geoprobe : Working Knowledge
Skill/Experience Level: Monitoring Well Installation : Working Knowledge

Skill/Experience Level: Recovery Well Installation : Fundamental Knowledge
Category: DRUMS
Skill/Experience Level: Cleaning : Fundamental Knowledge
Skill/Experience Level: Crushing/Disposal : Senior
Skill/Experience Level: Drums : Expert
Skill/Experience Level: Removal : Fundamental Knowledge
Skill/Experience Level: Selection of Drum Type: Senior
Skill/Experience Level: Testing : Fundamental Knowledge
Skill/Experience Level: Waste Characterization : Expert
Skill/Experience Level: Waste Disposal & Shipping : Expert
Category: EQUIPMENT SKILLS
Skill/Experience Level: Backhoe: Fundamental Knowledge
Skill/Experience Level: Bobcat: Fundamental Knowledge
Skill/Experience Level: Bulldozer: Fundamental Knowledge
Skill/Experience Level: CAT 320 Excavator: Fundamental Knowledge
Skill/Experience Level: Drill Rig: Fundamental Knowledge
Skill/Experience Level: Dump Truck: Fundamental Knowledge
Skill/Experience Level: Fork Lift: Working Knowledge
Skill/Experience Level: Front End Loader: Fundamental Knowledge
Skill/Experience Level: Man Lifts: Fundamental Knowledge
Skill/Experience Level: Truck (Fundamental Knowledge
Skill/Experience Level: Truck (>26,001): Fundamental Knowledge
Skill/Experience Level: Vac Truck: Working Knowledge
Skill/Experience Level: Water Truck: Fundamental Knowledge
Category: OPERATIONS AND MAINTENANCE
Skill/Experience Level: Manuals/Procedures : Fundamental Knowledge
Skill/Experience Level: Pilot-Plant Operations : Fundamental Knowledge
Skill/Experience Level: Soil Vapor Extraction Systems : Fundamental Knowledge
Skill/Experience Level: Wastewater Treatment Plant Operations : Fundamental Knowledge
Category: SAMPLING
Skill/Experience Level: Air : Fundamental Knowledge
Skill/Experience Level: Drilling : Fundamental Knowledge
Skill/Experience Level: Drums : Working Knowledge
Skill/Experience Level: Fixed Laboratory Analysis : Fundamental Knowledge
Skill/Experience Level: Mobile Laboratory Analysis : Fundamental Knowledge
Skill/Experience Level: Sampling : Working Knowledge
Skill/Experience Level: Soil : Working Knowledge
Skill/Experience Level: Underground Storage Tanks : Fundamental Knowledge
Skill/Experience Level: Wipe : Working Knowledge
Category: SURVEY
Skill/Experience Level: General Surveying : Fundamental Knowledge
Skill/Experience Level: GPS Control : Fundamental Knowledge
Skill/Experience Level: Hazardous Waste Survey : Fundamental Knowledge
Skill/Experience Level: Horizontal and Vertical Control : Fundamental Knowledge
Skill/Experience Level: Topographic : Fundamental Knowledge
Skill/Experience Level: Utility Locates : Fundamental Knowledge
Category: UNDERGROUND STORAGE TANKS
Skill/Experience Level: Cleaning : Fundamental Knowledge
Skill/Experience Level: Removal : Fundamental Knowledge
Skill/Experience Level: Testing : Fundamental Knowledge
Skill/Experience Level: Underground Storage Tanks : Fundamental Knowledge

Group: PROJECT MANAGEMENT SPECIALTIES
Category: CONSTRUCTION MANAGEMENT - SUBCONTRACTS ADMINISTRATION
Skill/Experience Level: Bid Analysis: Working Knowledge
Skill/Experience Level: Change Management: Fundamental Knowledge
Skill/Experience Level: File Management: Fundamental Knowledge
Skill/Experience Level: Spreadsheet Development: Fundamental Knowledge
Skill/Experience Level: Subcontract Bid Evaluation: Fundamental Knowledge
Skill/Experience Level: Subcontract Conformance: Fundamental Knowledge
Skill/Experience Level: Subcontract Pricing and Costing: Fundamental Knowledge
Skill/Experience Level: Subcontractor Prequalification Review: Fundamental Knowledge
Skill/Experience Level: Time and Materials Cost Control: Fundamental Knowledge
Skill/Experience Level: Union Labor Experience: Fundamental Knowledge
Category: ENGINEERING PROJECT CONTROLS
Skill/Experience Level: Construction Management Planning & Scheduling : Fundamental Knowledge
Category: PROCUREMENT
Skill/Experience Level: Inspection: Fundamental Knowledge
Skill/Experience Level: Logistics: Fundamental Knowledge
Skill/Experience Level: Purchasing: Fundamental Knowledge
Category: PROJECT ACCOUNTING
Skill/Experience Level: Billing Support : Fundamental Knowledge
Skill/Experience Level: Cost Accounting : Fundamental Knowledge
Skill/Experience Level: Government Property : Fundamental Knowledge
Skill/Experience Level: Procurement/Sourcing : Fundamental Knowledge
Skill/Experience Level: Shaw Policies/Procedures : Working Knowledge
Category: PROJECT MANAGEMENT
Skill/Experience Level: Construction Management : Fundamental Knowledge
Skill/Experience Level: Contract Management - Cost Reimbursable: Fundamental Knowledge
Skill/Experience Level: Contract Management - Firm Fixed Price: Fundamental Knowledge
Skill/Experience Level: Contract Management - T&M : Fundamental Knowledge
Skill/Experience Level: Cost/Scheduling : Fundamental Knowledge
Skill/Experience Level: Project Management : Fundamental Knowledge
Skill/Experience Level: Site Management : Fundamental Knowledge
Skill/Experience Level: Technical/Report Writing : Fundamental Knowledge

Group: TECHNICAL SPECIALTIES
Category: CONTAMINANT REMEDIATION
Skill/Experience Level: Acids : Fundamental Knowledge
Skill/Experience Level: Alkaline : Fundamental Knowledge
Skill/Experience Level: Arsenic : Fundamental Knowledge
Skill/Experience Level: Benzene : Fundamental Knowledge
Skill/Experience Level: Cadmium : Fundamental Knowledge
Skill/Experience Level: Chromium : Fundamental Knowledge
Skill/Experience Level: Compressed Gases: Fundamental Knowledge
Skill/Experience Level: Corrosives : Fundamental Knowledge
Skill/Experience Level: Cyanide : Fundamental Knowledge
Skill/Experience Level: DCA : Fundamental Knowledge
Skill/Experience Level: DCE : Fundamental Knowledge
Skill/Experience Level: Dioxin : Fundamental Knowledge
Skill/Experience Level: Flammable : Working Knowledge

Skill/Experience Level: Heavy Metals : Working Knowledge
Skill/Experience Level: Lead : Working Knowledge
Skill/Experience Level: Lead-Based Paint : Working Knowledge
Skill/Experience Level: Mercury : Fundamental Knowledge
Skill/Experience Level: Oil Refinery Waste : Fundamental Knowledge
Skill/Experience Level: Oily Sludge : Fundamental Knowledge
Skill/Experience Level: PCA : Fundamental Knowledge
Skill/Experience Level: PCE : Fundamental Knowledge
Skill/Experience Level: Petrochemical Refinery Waste : Fundamental Knowledge
Skill/Experience Level: Petroleum/Oil : Working Knowledge
Skill/Experience Level: Radioactive Waste (i.e., Plutonium, Uranium, etc.) : Fundamental Knowledge
Skill/Experience Level: Reactives (Air, Water) : Fundamental Knowledge
Skill/Experience Level: TCA : Fundamental Knowledge
Skill/Experience Level: TCE : Fundamental Knowledge
Skill/Experience Level: TPH : Working Knowledge
Skill/Experience Level: TSCA Managed Waste : Working Knowledge
Category: HEALTH AND SAFETY
Skill/Experience Level: Accident Investigation : Working Knowledge
Skill/Experience Level: Construction : Working Knowledge
Skill/Experience Level: Health Physics : Fundamental Knowledge
Skill/Experience Level: Industrial Hygiene : Fundamental Knowledge
Skill/Experience Level: Manuals/Procedures : Fundamental Knowledge
Skill/Experience Level: Noise : Working Knowledge
Skill/Experience Level: OSHA Reportables : Working Knowledge
Skill/Experience Level: Personnel Monitoring : Working Knowledge
Skill/Experience Level: Program Development : Fundamental Knowledge
Skill/Experience Level: Site Safety/Health Officer : Expert
Category: MIXED WASTE
Skill/Experience Level: Characterization : Fundamental Knowledge
Skill/Experience Level: Mixed Waste : Fundamental Knowledge
Category: NUCLEAR/RADIOLOGY
Skill/Experience Level: Radioactive Waste Management : Fundamental Knowledge
Category: QUALITY ASSURANCE
Skill/Experience Level: Analytical/Chemical Quality : Fundamental Knowledge
Skill/Experience Level: Construction : Working Knowledge
Skill/Experience Level: Engineering : Working Knowledge
Skill/Experience Level: Manuals/Procedures : Fundamental Knowledge
Skill/Experience Level: Plan Preparation : Fundamental Knowledge
Skill/Experience Level: Quality Control : Senior
Category: TREATMENT/REMEDIATION
Skill/Experience Level: Air Sparging : Fundamental Knowledge
Skill/Experience Level: Bioremediation : Fundamental Knowledge
Skill/Experience Level: Chemical Oxidation : Fundamental Knowledge
Skill/Experience Level: Contaminated Sediments : Fundamental Knowledge
Skill/Experience Level: Decontamination : Working Knowledge
Skill/Experience Level: Demolition : Fundamental Knowledge
Skill/Experience Level: Excavation : Working Knowledge
Skill/Experience Level: Groundwater Treatment : Fundamental Knowledge
Skill/Experience Level: Hazardous Materials Cleanup : Working Knowledge
Skill/Experience Level: Hazardous Waste Transportation : Senior

Skill/Experience Level: Soil Remediation : Fundamental Knowledge
Skill/Experience Level: Treatability Testing : Fundamental Knowledge
Skill/Experience Level: Wastewater Treatment : Fundamental Knowledge

Other Information

Years of Experience

Previous Employers: 9.00
CB&I: 14
Total of 23.00 year(s) experience

Experience in EPA Regions

Region 9 (AZ CA HI NV American Samoa, Guam, TT)

Industry Experience

Environmental

(b) (6) [redacted]

(b) (6) [redacted]

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

U.S. ARMY Corps of Engineers

US Army Corps of Engineers®

NAVFAC

PRESENTS THIS CERTIFICATE TO

Mark Vennemeyer

WHO HAS SUCCESSFULLY COMPLETED

January 28 & 29, 2010

U.S.A.C.E. Construction Quality Management for Contractors

Kugan Panchadsaram PE, PMP
CQM Facilitator
Kugan & Associates Inc.

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA

San Diego Chapter, Inc

"Building Your Quality of Life"

Glen Schaffer
AGC-San Diego Director of Marketing & Education
CQM Training Coordinator

This Certificate is valid for 5 years from the date above the IT group

CERTIFICATE *of* COMPLETION

Presented To

Mark J. Vennemeyer

In Recognition of Having Successfully Completed the Prescribed Course of Study for

40-Hour HAZWOPER Training

OSHA 29 CFR 1910.120 (e) (2) (i) through (e) (2) (vii)

I certify that the above trainee has completed this training course as given by The IT Group or one of its subsidiaries.

10/16/1992

EFFECTIVE DATE

Don L. Unruh

DON L. UNRUH, CIH, CSP
Manager, Internal Training Group

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

Mark Vennemeyer

SW9-02-15-00049

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

Concord, California	1/29/15 - 1/30/15	SW9 - NAVFAC Southwest	Michael Haliburton PMP , PE
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
Kugan Panchadsaram PE	kugan@kugan.com	858-212-2941	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: https://www.myuln.net

Jeffrey D. Dziedzic
Chief, USACE Learning Center
Jeffrey D. Dziedzic

Student Affiliation:
CB&I Federal Services
4433

Compliance Solutions
"Today's Training...Tomorrow's Solution"

3980 Quebec St., 2nd Floor, Denver CO 80207-1633 800-711-2706

Certificate of Completion

This is to certify that

Mark J. Vennemeyer

has been tested and successfully meets the training requirements for

8-Hour HAZWOPER Refresher
as per 29 CFR 1910.120(e)

Presented
Friday, June 12, 2015

Compliance Solutions Occupational Trainers, Inc.

Neval Gupta
Vice President

Jeffrey E. Kline
President/CEO

Certificate Number: 754898199

American Red Cross

Mark Vennemeyer

has successfully completed requirements for

Adult and Pediatric First Aid/CPR/AED: 2 Years

Date Completed: 03/22/2014

conducted by: American Red Cross

Instructor: Michael H Houston

ID: 0V0WFA

Scan code or visit:

redcross.org/confirm

This Certifies

Successful Completion Of The

SIPP Part 1 HSE Training for Supervisors

Name of Training Course

05-01903

Course Number

3.00

CEU

Mark Vennemeyer

Name

W B Hodges

Instructor

April 22, 2015

Date

This certification is only valid for CB&I and its subsidiaries and is not to be relied upon by any other employers of the named individual.

This Certifies

Successful Completion Of The

SIPP Part 2 CB&I Construction Safety

Name of Training Course

05-01904

Course Number

1.00

CEU

Mark Vennemeyer

Name

Instructor

April 24, 2015

Date

This certification is only valid for CB&I and its subsidiaries and is not to be relied upon by any other employers of the named individual.

Last Updated: 09 Apr 2015

Barbara A. Matz

Professional Qualifications

Ms. Matz has over 25 years of experience in geology and hazardous waste site characterization, including field geology, soil and groundwater sampling, data evaluation, plan preparation, report writing, subcontractor oversight, environmental compliance, interaction with public utilities and regulatory agencies, site safety and QC oversight, and technical review. Ms. Matz has supported, designed, and managed soil and groundwater monitoring programs in accordance with RCRA and CERCLA regulations, and achieved closure of UST sites with approval of State agencies. She has worked with a wide variety of federal and state agencies, as well as large commercial clients. Ms. Matz has maintained excellent client relations, high health and safety standards, and met quality assurance objectives throughout her career. She is a certified Site Safety Officer and Quality Control Manager, and a registered California Professional Geologist.

Education

Master of Science, Geology, University of Nevada - Reno, Reno, Nevada, [redacted]
Bachelor of Science, Geology, University of Nevada - Reno, Reno, Nevada, [redacted]
Bachelor of Science, Biology, Michigan Technological University, Houghton, Michigan, [redacted]

Additional Training/Continuing Education

OSHA 8-hour HAZWOPER refresher, October 2014
USACE Quality Systems Management, online refresher, 2012
Site-specific Radiation Worker Training, Shaw Treasure Island, 2012
10-Hour Construction Safety, Shaw Findlay OH, 2011
50-hour Site Safety Officer Training, Shaw, Findlay OH, 2011
Sustainable Remediation Methods for Soils and Water, UC Berkeley Extension, 2011
XRF Operations and Safety, Shaw San Francisco, 2010
USACE Quality Systems Management, 2007
Contaminant Forensics, NW Env Training Center, 2007
OSHA 1926 Construction Site Supervisor, Shaw E&I, 2004
Characterization & Toxicity Assessment of Mine Waste, Geological Society of America, 2004
Aerial Photography Interpretation Workshop, Groundwater Res Assn of CA, 2003
Ecological Risk Assessment Short Course, UC Berkeley Extension, 2002
Natural Attenuation Short Course, UC Berkeley Extension, 2001
Lead and Asbestos Site Supervisor Refreshers, UC Berkeley Extension, 1997
Asbestos Sampler and Site Supervisor, Field Sciences Inst, Albq NM, 1996
Lead Sampler and Site Supervisor, Field Sciences Inst, Albq NM, 1996
OSHA Excavation Safety Training, IT Corporation, 1994
Graduate Geology Seminars - University of New Mexico, 1991-1993
OSHA Hazardous Waste Site Supervisor, IT Corporation, 1992
Radiation Safety, Sandia National Laboratories, 1991
OSHA 40-Hour Hazardous Waste Operations, IT Corporation, 1989

Registrations/Certifications/Licenses

USACE Construction Quality Control Manager, 2007, Active, Nationwide, expires 10/2017
Professional Geologist, 2000, Active, California #7117, expires 10/2016

Experience and Background

01/2013 – Present
Project Geologist/QCM/SSO, CB&I Federal Services, Concord, California

Acting QCM at former Alameda Naval Station, CA (August 2013 to present); alternate SSO for Site 29, Naval Weapons Station Seal Beach, Concord, CA (August 2013 to present); served as QCM and SSO at former Naval Station Treasure Island, San Francisco, CA (January 2013); provided QC review of reports and plans for a variety of sites in California, Nevada, and Arizona (January 2013 through present); supported U.S. Army Redstone Arsenal, Huntsville, AL, by writing and reviewing various chapters of RI Reports for groundwater and soil sites (February 2013 through present).

01/2007 - 01/2013
Task Manager, Shaw Environmental & Infrastructure, Inc., San Francisco, California

Project: Naval Station Treasure Island. Tasks: Site 12 SWDAs, Building 233 Demolition. Work included task management: subcontractor oversight, plan and report preparation, procurement support, field supervision, client/agency meetings; and QC oversight: inspections, daily reports, meetings, and field work variance preparation; acting QC / SSO during January 2013.

05/2002 - 12/2011
Project Geologist, Shaw Environmental & Infrastructure, Inc., Concord, California

Project: TERC II National Park Service. Provided support to client projects as technical and task manager, site geologist, site safety and QC officer. Investigated sites at national parks including Yosemite, Lassen Volcanic, Redwood, Whiskeytown, and Death Valley. Responsibilities included budget and plan preparation, field work variance preparation, client meetings, supervision of technical staff and subcontractors, data evaluation, and report preparation.

The following is a summary of key projects:
<u>Technical Manager, Treasure Island Site 12, 122412, US Navy, Treasure Island, San Francisco, CA, $12,000,000.00, 03/2007 - present</u>
Remediation of former solid waste disposal areas by excavation and soil replacement, including radiation monitoring and confirmation sampling for chemical and radiological contaminants.

Accomplishments:
Planning, subcontractor oversight, client meetings, data management and presentation, reporting, QC oversight.

<u>Technical/Task Manager, TERC II - NPS, 870508, USACE and National Park Service, Yosemite National Park, CA, $3,000,000.00, 05/1999 - Present</u>
Budget preparation, plan preparation, procurement support, supervision of Shaw and subcontractor field personnel, soil and groundwater sample collection, site safety and QC oversight, data evaluation, report preparation, and meetings with client and regulatory agencies.

Accomplishments:
Closure of three UST sites, closure pending on one additional UST site.

Outreach, WalMart, WalMart, various, 01/2006 - 10/2006
Prepare and distribute Environmental Compliance Manuals to WalMart stores in Arkansas, Louisiana, Arizona, and Colorado.

Accomplishments:
Planning, manual preparation, manual distribution, store manager training.

Site Geologist, Navy CLEAN RAC - NAVSTA Treasure Island, 843431, Navy, Treasure Island, San Francisco, CA, 04/2003 - 06/2005
Building 233 Survey - Procurement support, plan preparation, supervision of Shaw and subcontractor field personnel, soil and groundwater sampling, data evaluation, and report preparation.

Project Geologist, Treasure Island CTO 99, US Navy, Treasure Island, San Francisco, CA, 04/2003 - 02/2005
Data gaps investigation of CERCLA sites.

Accomplishments:
Field sampling, data evaluation, report preparation.

Project Geologist, Hamilton Field, USACE and Army, Hamilton Field, Novato, CA, 06/1997 - 05/1999
Investigation of former army airfield, including soil, sediment, and water sampling.

Accomplishments:
Plan preparation, field sampling, subcontractor oversight, reporting, client and regulatory meetings.

Project Scientist, Sandia National Laboratories, US Department of Energy, Sandia National Laboratories, Albuquerque, NM, 11/1989 - 06/1997
Planning, budget preparation, procurement, field sampling, subcontractor oversight, reporting, client and regulator interaction.

Accomplishments:
Managed groundwater monitoring tasks at two landfills, managed basewide background groundwater monitoring, participated in building decontamination/demolition sampling, and various small sampling and reporting tasks on the base.

Project Scientist, Nevada Test Site, Off-Site Projects, various, US Department of Energy, various sites around U.S., 10/1993 - 05/1997
Supported off-site projects at Hattiesburg MS and Rifle CO - field sampling, subcontractor oversight, reporting. Intermittent assignments concurrent with Sandia and other off-site projects.

Accomplishments:
Managed confirmation sampling program, installed deep monitoring wells, met site requirements within QC and H&S standards.

Project Scientist, Carswell NAS, US Navy, Carswell Naval Air Station, Forth Worth TX, 04/1995 - 05/1995
Monitoring well installation, groundwater sampling.

Accomplishments:
Subcontractor oversight, client interaction.

04/2003 - 01/2007
Task Manager, Shaw Environmental & Infrastructure, Inc., San Francisco, California

Project: Naval Station Treasure Island. Tasks: Environmental Baseline Study, Site 12 Trench Investigation, Building 233 Survey. Work included field sampling, subcontractor oversight, plan and report preparation, procurement support, client meetings.

06/1997 - 05/2002
Project Geologist, IT Corporation (The Shaw Group Inc., acquired substantially all of the operating assets of The IT Group, Inc., on May 23, 2005), Concord, California

Performed as task manager, technical manager, and site geologist for a variety of sites and clients. Responsible for budget input, plan preparation, procurement support, field planning, field supervision of staff and subcontractors, review of analytical data, preparation of reports, meetings with client and applicable regulators to review work and needs.

11/1989 - 06/1997
Geologist, IT Corporation, Albuquerque, New Mexico

Planning, site supervision, reporting.

Professional Affiliations

Geological Society of America, Professional Member, none, 2004
American Institute of Professional Geologists, Registered Member, none, 2002
Northern California Geological Society, Regular Member, President, 2007-2009, 2000

Barbara A. Matz

Title: Scientist 4
Employee Number: [redacted]
Location: Concord, CA
Location2:
Business Unit: Fed AS&E West, Home
Company: Shaw Environmental, Inc

Contact Information

Work Phone: 925-288-2337
Cell Phone: 415-713-8482

Skills

Group: FIELD SERVICES SPECIALTIES
Category: DRILLING
Skill/Experience Level: Borings : Working Knowledge
Skill/Experience Level: Drilling : Working Knowledge
Skill/Experience Level: Geoprobe : Working Knowledge
Skill/Experience Level: Monitoring Well Installation : Working Knowledge
Category: SAMPLING
Skill/Experience Level: Asbestos : Fundamental Knowledge
Skill/Experience Level: Drilling : Working Knowledge
Skill/Experience Level: Drums : Fundamental Knowledge
Skill/Experience Level: Sampling : Working Knowledge
Skill/Experience Level: Soil : Working Knowledge
Skill/Experience Level: Underground Storage Tanks : Working Knowledge
Skill/Experience Level: Wipe : Working Knowledge
Category: UNDERGROUND STORAGE TANKS
Skill/Experience Level: Cleaning : Fundamental Knowledge
Skill/Experience Level: Closure : Working Knowledge
Skill/Experience Level: Removal : Working Knowledge
Skill/Experience Level: Testing : Fundamental Knowledge

Group: TECHNICAL SPECIALTIES
Category: GEOLOGY
Skill/Experience Level: Engineering Geology : Fundamental Knowledge
Skill/Experience Level: Fault Studies : Working Knowledge
Skill/Experience Level: Geologic Studies : Working Knowledge
Skill/Experience Level: Geological Age Dating : Working Knowledge
Skill/Experience Level: Geophysical Survey : Fundamental Knowledge
Skill/Experience Level: Geotechnical Studies : Fundamental Knowledge
Skill/Experience Level: Remote Sensing : Working Knowledge
Skill/Experience Level: Seismicity Evaluation : Fundamental Knowledge
Skill/Experience Level: Structural Geology : Working Knowledge
Skill/Experience Level: Structural Mapping : Working Knowledge
Category: SITE INVESTIGATION
Skill/Experience Level: Aerial Photography Interpretation : Working Knowledge
Skill/Experience Level: Borehole Television : Fundamental Knowledge

Skill/Experience Level: Excavation of Test Pits/Trenches : Working Knowledge
Skill/Experience Level: Ground Penetrating Radar : Fundamental Knowledge
Skill/Experience Level: Groundwater Monitoring/Recovery Well Installation: Working Knowledge
Skill/Experience Level: Permeability Testing : Fundamental Knowledge
Skill/Experience Level: RCRA Facility Investigation : Working Knowledge
Skill/Experience Level: Remedial Action Plan : Working Knowledge
Skill/Experience Level: Remedial Investigation : Working Knowledge
Skill/Experience Level: RI/FS : Working Knowledge
Skill/Experience Level: Risk Assessment : Fundamental Knowledge
Skill/Experience Level: Site Investigation : Working Knowledge
Skill/Experience Level: Subsurface Investigation : Working Knowledge
Skill/Experience Level: Test Pits : Working Knowledge
Skill/Experience Level: Topographic Survey : Working Knowledge
Skill/Experience Level: Trenching : Working Knowledge
Category: WATER RESOURCES
Skill/Experience Level: Limnology : Fundamental Knowledge
Skill/Experience Level: Storm Water Management : Fundamental Knowledge
Skill/Experience Level: Water Quality : Fundamental Knowledge
Skill/Experience Level: Wells : Working Knowledge

Other Information

Years of Experience
Previous Employers: 0.00
CB&I: 25.25
Total of 25.25 year(s) experience

Experience in EPA Regions
Region 6 (AR LA NM OK TX)
Region 8 (CO MT ND SD UT WY)
Region 9 (AZ CA HI NV American Samoa, Guam, TT)

Industry Experience
Environmental

(b) (6) [redacted]

(b) (6) [redacted]

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

Barbara Matz

SW9-02-17-00348

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

Concord, California	10/19/17 - 10/20/17	SW9 - NAVFAC Southwest	Michael Haliburton PMP, PE
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
Kugan Panchadsaram PE	kugan@kugan.com	858-212-2941	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: https://www.myuln.net

Chief, USACE Learning Center
Jeffrey D. Dziedzic

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC
Naval Facilities Engineering Command

CERTIFICATE
this is to certify that

Barbara Matz

has completed the Corps of Engineers and Naval Facilities Engineering Command Training Course

Construction Quality Management for Contractors Recertification

Certificate Number: SPK-99-07-00375

Given on October 17, 2012

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Gary L. Anderson
Director, USACE Learning Center

CEHR-P Form 586 (REVISED)
1 AUG 98

Last Updated: 24Mar2017

Kevin J. O'Leary

Professional Qualifications

Kevin J. O'Leary
Professional Qualifications

Mr. O'Leary has over twenty-nine years of professional experience working on a variety of government and commercial environmental investigation/remediation projects. Past experience includes serving as project manager, field manager, technical engineering/scientist lead, construction quality manager and site safety officer for large and small government and commercial remedial investigation/feasibility study and site remediation projects, providing project management for the removal and disposition of low-level radiological and mixed waste at a University of California research facility, conducting investigation and remediation of facilities at high-profile United States National Parks and California State Parks, field and technical oversight for EPA Superfund Sites, and feasibility analysis of project plans, adherence to strict quality assurance/quality control and health and safety programs and hydro-geologic data collection, interpretation and report writing.

Mr. O'Leary has gained extensive experience supervising drilling (direct push, hollow stem auger, dual-tube percussion, resonant sonic, mud rotary and air rotary-casing hammer methods) and well installations at government and commercial projects. He has also provided field management and technical oversight for the installation /operations/maintenance of direct and recirculating bio-injection groundwater treatment systems, soil vapor extraction (SVE) treatment systems, aboveground storage tank (AST), underground storage tank (UST), fuel pipeline and oil-water separator removals, the characterization, excavation and proper disposal of hazardous materials, the closure of RCRA Class 1 landfill facilities and CERCLA sites, the coordination and execution of sampling and analysis plans and as a liaison with local, state, and federal regulatory agencies.

Currently, Mr. O'Leary serves with CB&I Federal Services L.L.C. as Site Superintendent, Quality Control Manager and Site Safety Officer for the Remedial Action at Installation Restoration Site 17, NASA Crows Landing Flight Facility, Crows Landing, California while supporting government and commercial client projects as a project hydrogeologist, project manager, field operations manager, construction quality manager and site safety officer.

Education

Bachelor of Science, Physical Science-Hydrology, California State University-Chico, Chico, California, (b) [redacted]

Additional Training/Continuing Education

US Army Corps of Engineers-Construction Quality Management (CQM) Training, Sacramento, CA, 2015
Site Safety Officer Training, Findlay, OH, 2011
Construction Site Supervisor Training, Findlay, OH, 2011

US Army Corps of Engineers-Construction Quality Management (CQM) Training, Concord, CA, 2010
Bay Area Refinery Process Safety Orientation Program-Bay Area Training Corporation (BATC) , Martinez, CA, 2004
Excavation Competent Person Training, 29 CFR 1910.120, Martinez, CA, 1998
Nuclear Density Gauge Operator Training, 49 CFR 172H, Martinez, CA, 1998
Radiation Worker II Training, 29 CFR 1910.120, Davis, CA, 1997
Project Management Training , Martinez, CA, 1994 and Concord, CA, 2010
Principles of Integrated Solid Waste Management, UC Berkeley, 1993
Hazardous Materials in Groundwater: Hydrology, Monitoring, and Remediation, UC Berkeley, 1992
Confined Space/Qualified Person Training, 29 CFR 1910.120 , Martinez, CA, 1992
Hazardous Waste Supervisor Training, 29 CFR 1910.120 , Martinez, CA, 1992
40 Hour OSHA Hazardous Materials Health and Safety Training, 29 CFR 1910.120 (updated annually), Martinez, CA, 1988

Registrations/Certifications/Licenses

USACE Construction Quality Control Manager, 2015, Active, Nationwide, 03/20/2020
First Aid and CPR - Basic, 1988, Active, Nationwide, 04/2017
Radiological Worker Level II, 1997, Inactive, Nationwide, 05/2004
Cert Hazardous Waste Supervisor-OSHA/19CFR1910.120, 1992, Active, Nationwide
Certified HAZWOPER, 1988, Active, Nationwide
Competent Person/Drilling Oversight (CPDO), 2002, Active, Nationwide
Construction Site Safety Supervisor, 2011, Active, Nationwide
Excavation Competent Person, 1998, Active, Nationwide
Nuclear Soil Gauge, 1998, Active, Nationwide

(b) (6) [redacted]

Experience and Background

05/2002 – present
Project Manager/Field Site Manager, CB&I Federal Services, L.L.C. (CB&I) and Shaw Environmental & Infrastructure, Inc., Concord, California

Responsibilities include providing support to government and commercial client projects and office staff as a Project Manager/Field Site Manager. Also responsible for business development and managing and contributing to project proposals.

The following is a summary of key projects:
<u>Site Superintendent, Quality Control Manager and Site Safety Officer, Remedial Action at Installation Restoration Site 17, NASA Crows Landing Flight Facility, Crows Landing, CA, 500289, NAVFAC, Crows Landing, CA, $8,000,000, 05/2015 – present.</u>
Field Site Manager/Superintendent, Quality Control Manager Site Safety Officer at the NASA Crows Landing Flight Facility, Crows Landing, CA, Installation Restoration Site 17 – Remedial Action in Crows Landing, CA. Currently providing Field Management and serving as Quality Control Manager and Site Safety Officer for the installation, operations and maintenance of the Recirculating Bio Injection Groundwater Treatment System.

Field Site Manager/Superintendent and Site Safety Officer, Former Naval Weapons Station - Detachment Concord, Concord, CA, Installation Restoration Site 29 Source Area – Non-Time Critical Removal Action for Groundwater and Soil Gas Remediation, 147615, NAVFAC, Concord, CA, $10,000,000.00, 10/2013 – 01/2015
Field Site Manager/Superintendent and Site Safety Officer at the NAVFAC Former Naval Weapons Station - Detachment Concord, Concord, CA, Installation Restoration Site 29 Source Area – Non-Time Critical Removal Action for Groundwater and Soil Gas Remediation project in Concord, CA. Currently providing Field Management, Technical Oversight and serving as Site Safety Officer of Direct Push Drilling/Bio Injection for the Groundwater Remediation task and providing Field Management, Technical Oversight and Site Safety Officer duties of Hollow Stem Auger Well Drilling and Soil Gas Extraction System construction for the Soil Gas Remediation task.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.
Completed work scopes under budgets.

Awards/Client Commendations:
Client letters of commendation.

Field Project Manager/Technical Lead/Site Safety Officer, Aerojet, 134058, Aerojet-General Corporation, Sacramento/Rancho Cordova, CA, $1,000,000.00, 03/2013 – 04/2014
Field Project Manager, Technical Lead and Site Safety Officer for Aerojet-General Corporation's Field Environmental Restoration Program in Sacramento/Rancho Cordova, CA. Responsibilities require the management and technical leadership of tasks related to the groundwater, surface water, soils/sediments and soil vapor remedial investigations being conducted at the Prairie City State Vehicular Recreation Area and Barton Ranch for Aerojet’s Boundary Operable Unit-Site 39 Additional Investigation.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.
Completed work scopes under budgets.

Awards/Client Commendations:
Client letters of commendation.

Project Manager, Kato Road L.L.C., 775929, Landbank, Fremont, CA, $2,000,000.00, 06/2002 – 04/2014
Conduct Groundwater Monitoring Program and provide site closure consulting.

Accomplishments:
Completed work scopes under budgets.
Assisted negotiations to reduce Groundwater Monitoring Program frequency and site closure.
Annual Contract Extensions.

Awards/Client Commendations:
Client letters of commendation.

Assistant Task Manager/Cost and Schedule Analyst/Assistant Construction Quality Manager/Technical Lead and Assistant Site Safety Officer, Fort Ord-Monterey, CA, Lead

Removal, Munitions and Explosives of Concern (MEC) Field Reconnaissance, Munitions and Explosives of Concern (MEC) Removal and Operable Unit Carbon Tetrachloride Plume (OUCTP) projects, 846075 and 141234, US Army Corps of Engineers (USACE), Fort Ord-Monterey, CA, approximately $20,000,000.00, 11/2009 - 09/2010
Performed Assistant Task Management, Cost and Scheduling, Construction Quality Management, Technical Lead and Site Safety Officer functions for the US Army Corps of Engineers' Total Environmental Restoration Contract (TERC) Fort Ord-Monterey, CA Lead Removal, Munitions and Explosives of Concern (MEC) Removal and Operable Unit Carbon Tetrachloride Plume (OUCTP) projects.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.
Completed work scopes under budgets.
Contributed to Fort Ord project receiving Shaw President's Award for achieving 5,000 days without a lost workday incident.

Project Manager, Orton Development, 779332, Orton Development, Hayward, CA, $100,000.00, 06/2002 - 04/2014
Conduct Groundwater Monitoring Program and provide site closure consulting.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.
Completed work scopes under budgets.
Annual contract extensions.

Field Project Manager/Technical Lead/Site Safety Officer, Aerojet, 127495, 134058, Aerojet-General Corporation, Sacramento/Rancho Cordova, CA, $16,000,000.00, 08/2005 - 06/2010
Field Project Manager, Technical Lead and Site Safety Officer for Aerojet-General Corporation's Field Environmental Restoration Program in Sacramento/Rancho Cordova, CA. Responsibilities required the management and technical leadership of tasks related to the groundwater, surface water, soils/sediments and soil vapor remedial investigations being conducted at multiple sites for Aerojet's Boundary, Island and Eastern Operable Units. Also contributed on Aerojet's Boundary, Island and Eastern Operable Units RI/FS reports.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.
Completed work scopes under budgets.
Annual contract extensions.

Awards/Client Commendations:
Client letters of commendation.

Project Manager/Technical Lead, Travis Air Force Base, 133028, United States Air Force/AFCEE, Travis, CA, $86,000.00, 11/2008 - 05/2009
Project Manager and Technical Lead for the Site Characterization at Facility 1514 and Reservoir 1518 Hydroflousalic Acids Spill at Travis AFB.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.

Completed work scopes on schedule and under budgets.

Awards/Client Commendations:
Client letters of commendation

Project Manager, Laboratory for Energy-Related Health Research (LEHR), 770529, DOE-Oakland/Weiss Associates, Davis, CA, $14,000,000.00, 06/1997 - 11/2007
Managed multiple tasks related to the $14 million, performance-fee-driven, Environmental Restoration/Waste Management project at the United States Department of Energy's (DOE) former Laboratory for Energy-Related Health Research (LEHR) facility at the University of California, Davis.
Provided management, cost analysis, staff and technical supervision, oversight of project subcontractor contracts and providing the interface and coordination necessary to accomplish Shaw Environmental & Infrastructure commitments that were an essential contribution to a team of three contractors that are working together to meet the Department of Energy's aggressive overall project goals. The removal and disposal of laboratory-related radiological waste (Ra-226, Sr-90, Co-60, H-3, Pu-241, Am-241) and mixed waste from disposal trenches and septic systems, the decontamination and demolition of radiation contaminated facilities, the inventory, survey and shipment of radioactive biological wastes and radiological sources and standards to disposal facilities and the investigation and survey of potentially radiological contaminated facilities (Imhoff Ra-226/Sr-90 Treatment System, Mixed Waste Storage Facility, Western Dog Pens) and environmental conditions (Southwest Trenches waste burial site) are among the ongoing/completed tasks during this period.

Accomplishments:
Awarded over $500K (over 95%) of available project Performance Incentive Fees.
Zero lost work day incidents. Zero vehicle accidents.

Awards/Client Commendations:
Awarded over $500K (over 95%) of available project Performance Incentive Fees.
Client Health and Safety performance awards.

Project Manager, Lawrence Livermore National Laboratory (LLNL), 109575, University of California, Livermore, CA, $150,000.00, 04/2004 - 07/2005
Project Manager for Low Level/Mixed Waste Technical Support for the University of California at Lawrence Livermore National Laboratory

Accomplishments:
Contract extended in November 2004

Awards/Client Commendations:
Client letters of commendation.

05/2002 - present
Project Engineer/Scientist IV-Hydrogeologist, CB&I Federal Services, L.L.C. (CB&I) and Shaw Environmental & Infrastructure, Inc., Concord, California

Responsibilities include providing technical support to government and commercial client projects and office staff as a Project Hydrogeologist. Also responsible for business development and managing and contributing to project proposals.

The following is a summary of key projects:

Field Operations/Technical Oversight and Sample Coordinator, Yerington, NV, Field Operations/Technical Oversight and Sample Coordination at the Former Atlantic Richfield Company (ARC) Yerington-Anaconda Mine Site, Yerington, NV, 89447, US Environmental Protection Agency-San Francisco, CA. 02/2016 – present.
Field Operations/Technical Oversight and Sample Coordination

Field Operations/Technical Oversight and Sample Coordinator, Sunnyvale CA, Indoor and Outdoor Air Sampling Oversight at The Companies Offsite Operable Unit of the Triple Site, Sunnyvale, California, 500291, US Environmental Protection Agency-San Francisco, CA. 01/2015-10/2016.
Indoor and Outdoor Air Sampling Oversight and Sample Coordination

Project Hydrogeologist, DLA Energy-Fort Hood 2014 Fuel Spill Investigation and Recovery, 500238, US Army, Fort Hood-Killeen, TX , 10/2014-12/2014
Project Hydrogeologist/Drilling Rig Supervisor/Sample Coordinator

Project Hydrogeologist, Vandenberg AFB-Lompoc, CA, Installation Restoration Program -Site 3 and 50 Draft Groundwater Monitoring and Remedial Action Optimization Status Report, 01/2013 – 06/2014
Coauthor of Site 3 and 50 Draft Groundwater Monitoring and Remedial Action Optimization Status Reports for the Vandenberg AFB-Lompoc, CA, Installation Restoration Program

Project Hydrogeologist, Vandenberg AFB-Lompoc, CA, Installation Restoration Program – Site 60 Draft Groundwater Monitoring and Remedial Action Optimization Status Report, 03/2013
Author of Site 60 Draft Groundwater Monitoring and Remedial Action Optimization Status Report for the Vandenberg AFB-Lompoc, CA, Installation Restoration Program.

Project Hydrogeologist, Edwards AFB-Air Force Research Laboratory Groundwater Tracer Test for Bioremediation Feasibility, 146185, AFCEE, Edwards AFB, CA, 01/2013-03/2013
Project Hydrogeologist for the drilling and well installations at the Edwards AFB-Air Force Research Laboratory Groundwater Tracer Test for Bioremediation Feasibility. Performed Groundwater Tracer Test and data analysis for Bioremediation Feasibility.

Accomplishments:
Zero lost work day incidents, Zero vehicle accidents.

Wellsite/Operations Hydrogeologist, Intrepid Potash – New Mexico, L.L.C. HB In-Situ Project, 124303 and 146979, Intrepid Potash, Eddy County-Carlsbad, NM, 05/2012-10/2012
Wellsite/Operations Hydrogeologist for the drilling and well installations at the Intrepid Potash in-situ potash solution mining project in Eddy County-Carlsbad, NM.
Conducted geologic logging of mud rotary/reverse circulation drilling method boreholes and supervised drill crews, geophysical logging, casing and liner installations, design and pumping of cement jobs and well completions associated with the installation of high capacity brine injection and production wells. Advised on casing failures, fish jobs, circulation losses, gas kicks and selection of BHA’s and drilling muds. Identified formation changes/tops and bottoms that aided in final well installation designs. Responsible for drill crew and visitor Health and Safety at drill sites.

Accomplishments:
Zero lost work day incidents, Zero vehicle accidents by crews and visitors at supervised drill sites.

<u>Field Task Manager/Technical Lead/Report Coauthor, BLM/Fort Ord Reconnaissance-Site Assessments, 846075, 141234, USACE, Fort Ord-Monterey, CA, 09/2010 - 01/2012</u>
Field Task Manager and Technical Lead for the Reconnaissance-Site Assessments of Bureau of Land Management (BLM) Areas at the Former Fort Ord-Monterey, CA.
The Reconnaissance-Site Assessments of four (4) BLM areas totaling approximately 5,000 acres each consisted of either visual and/or instrument-aided field investigations to map site features that may have been related to past military training activities, map munitions and explosives of concern (MEC), map the path walked and identify subsurface anomalies where a magnetometer (Schonstedt GA-52/CX and EM-61) was used. Responsibilities included walking over 300 linear miles of regulatory agency preplanned routes, written and photo documentation of findings, data processing and coauthor of the Site Assessment Data Reports for each of the BLM areas.

Accomplishments:
Zero lost work day incidents, Zero vehicle accidents.
Contributed to Fort Ord project receiving Shaw President's Award for achieving 5,000 days without a lost workday incident.
Completed Reconnaissance-Site Assessments and Reports on schedule and within budgets.

<u>Project Hydrogeologist, Dugway Proving Ground, 870502, US Army, Dugway, UT, 06/2004 - 10/2004</u>
Performed as Project Hydrogeologist, Drilling Rig Supervisor and Sample Coordinator for monitoring well installation and soil/groundwater sample collection of deep borings at HWMU 55 and HWMU 58.
Coordinated storage, characterization and disposition of Investigation Derived Waste materials.

<u>Project Hydrogeologist, Alameda Point, 101643, US Navy, Alameda, CA, 03/2004 - 10/2004</u>
Technical Lead for the location and site characterization of approximately 500 linear feet of Industrial Waste Pipeline at IWTP 25.
Authored project plans and SOWs, performed as Project Hydrogeologist and Drilling Rig Supervisor for soil/groundwater sample collection from soil borings at former Industrial Waste Treatment Plants (IWTPT) at Buildings 25 and 32. Contributed as author for the project technical report.

Accomplishments:
Contributed to Alameda Point project receiving Shaw President's Award for achieving 1,500 days without a lost workday incident.

<u>Project Hydrogeologist, Sandia National Laboratory-Bldg 913 Soil Sampling, 777674, Sandia National Laboratory, Livermore, CA, 02/2003 - 08/2003</u>
Authored project plans and SOWs. Performed as Technical Lead, Project Hydrogeologist and Drilling Rig Supervisor for soil/groundwater sample collection from soil borings at Bldg 913. Contributed as author for the project technical report.

Accomplishments:
Zero lost work day incidents, Zero vehicle accidents.
Completed work scopes under budgets.

08/2011 - Present
Site Safety Officer, Chicago Bridge & Iron Company (CB&I) and Shaw Environmental & Infrastructure, Inc., Concord, California

Responsibilities include providing Site Safety oversight for government and commercial client projects.

Key projects:

Remedial Action at Installation Restoration Site 17, NASA Crows Landing Flight Facility, Crows Landing, CA, 500289, NAVFAC, Crows Landing, CA, 05/2015 – present.

Former Naval Air Station Moffett Field, Moffett Field, CA – Combined Enhanced Anaerobic Bioremediation (EAB) / In Situ Chemical Reduction (ISCR) Treatability Study at the Former Traffic Island Area of Installation Restoration Program Site 28, CTO-0104, 500238, 10/2014 – 05/2016.

Former Naval Weapons Station - Detachment Concord, Concord, CA, Installation Restoration Site 29 Source Area – Non-Time Critical Removal Action for Groundwater and Soil Gas Remediation, 147615, 10/2013 – 01/2015.

Former Naval Air Station Moffett Field, Moffett Field, CA – Supplemental Investigation, Former Building 88 and Traffic Island Areas – Installation Restoration Program Site 28, CTO-0046, 144002, 08/2013 – 02/2014

Aerojet-General Corporation, Sacramento/Rancho Cordova, CA, Boundary Operable Unit - Site 39 Additional Investigation, 134058, 08/2005 – 10/2013

Edwards AFB-Air Force Research Laboratory Groundwater Tracer Test for Bioremediation Feasibility, 146185, AFCEE, Edwards AFB, CA, 01/2013-03/2013

Fort Ord-Monterey, CA, US Army Corps of Engineers (USACE), Munitions and Explosives of Concern (MEC) Field Reconnaissance, 09/2010 - 01/2012

Fort Ord-Monterey, CA, US Army Corps of Engineers (USACE), Lead Removal, 11/2009 - 09/2010

11/2009 - Present
Construction Quality Control Manager, Chicago Bridge & Iron Company(CB&I) and Shaw Environmental & Infrastructure, Inc., Concord, California

Responsibilities include Construction Quality Control Management for government and commercial client projects. Includes managing quality aspects of field construction, field technical, analytical data, cost/schedule activities and technical report review.

Key projects:

Remedial Action at Installation Restoration Site 17, NASA Crows Landing Flight Facility, Crows Landing, CA, 500289, NAVFAC, Crows Landing, CA, 05/2015 – present.

Former Naval Air Station Moffett Field, Moffett Field, CA – Combined Enhanced Anaerobic Bioremediation (EAB) / In Situ Chemical Reduction (ISCR) Treatability Study at the Former Traffic Island Area of Installation Restoration Program Site 28, CTO-0104, 500238, 10/2014 – 05/2016.

Former Moffett Field, Moffett Field, CA – Supplemental Investigation, Former Building 88 and Traffic Island Areas – Installation Restoration Program Site 28, CTO-0046, 144002, 08/2013 – 02/2014

Former Naval Weapons Station - Detachment Concord, Concord, CA, Installation Restoration Site 29 Source Area – Non-Time Critical Removal Action for Groundwater and Soil Gas Remediation, 147615, 10/2013

Vandenberg AFB-Lompoc, CA, Installation Restoration Program -Site 24 Draft Groundwater Monitoring and Remedial Action Optimization Status Report, 07/2013

Vandenberg AFB-Lompoc, CA, Installation Restoration Program-Site 24 Draft Feasibility Study Report, 04/2012

Vandenberg AFB-Lompoc, CA, Installation Restoration Program-Site 50 Draft Feasibility Study Report, 03/2012

Fort Ord-Monterey, CA, US Army Corps of Engineers (USACE), Munitions and Explosives of Concern (MEC) Field Reconnaissance, 09/2010 - 01/2012

Fort Ord-Monterey, CA, US Army Corps of Engineers (USACE), Lead Removal, 11/2009 - 09/2010

05/1997 - 05/2002
Project Manager, IT Corporation (The Shaw Group Inc. acquired substantially all of the operating assets of the IT Group Inc. in May 2002), Martinez, California

Responsibilities included providing support to government and commercial client projects and office staff as a Project Manager. Also responsible for business development and managing and contributing to project proposals.

The following is a summary of key projects:
Project Manager, Laboratory for Energy-Related Health Research (LEHR), 770529, DOE-Oakland/Weiss Associates, Davis, CA, $7,000,000.00, 06/1997 - 05/2002
Managed multiple tasks related to the $14 million, performance-fee-driven, Environmental Restoration/Waste Management project at the United States Department of Energy's (DOE) former Laboratory for Energy-Related Health Research (LEHR) facility at the University of California, Davis.
Provided management, cost analysis, staff and technical supervision, oversight of project subcontractor contracts and providing the interface and coordination necessary to accomplish Shaw Environmental & Infrastructure commitments that are an essential contribution to a team of three contractors that are working together to meet the Department of Energy's aggressive overall project goals. The removal and disposal of laboratory-related radiological waste (Ra-226, Sr-90, Co-60, H-3, Pu-241, Am-241) and mixed waste from disposal trenches and septic systems, the decontamination and demolition of radiation contaminated facilities, the inventory, survey and

shipment of radioactive biological wastes and radiological sources and standards to disposal facilities and the investigation and survey of potentially radiological contaminated facilities (Imhoff Ra/Sr Treatment System, Mixed Waste Storage Facility, Western Dog Pens) and environmental conditions (Southwest Trenches waste burial site) are among the ongoing/completed tasks during this period.

01/1988 - 05/2002
Project Engineer/Scientist I, II, III-Hydrogeologist, IT Corporation, Martinez, California

Responsibilities included providing support to government and commercial client projects and office staff as a Project Hydrogeologist. Also responsible for business development and managing and contributing to project proposals.

The following is a summary of key projects:
Lead Hydrogeologist, Mather Air Force Base, US Air Force (AFCEE), Sacramento, CA, $17,800,000.00, 01/1993 - 12/1994
Lead Hydrogeologist/Project Management Staff, Additional Field Investigation (AFI), Mather Air Force Base (AFB), Sacramento, California 1993-1994).
Responsible for providing technical oversight and supervision for the field investigation associated with the fixed-price $17.8-million AFCEE Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) RI/FS project. These responsibilities included technical oversight and supervision for a field staff of up to 25 associates during drilling operations as well as management, scheduling, and oversight of project subcontractors and their contracts. The investigation required accessing the subsurface with air rotary/casing hammer (ARCH), mud rotary, dual-tube percussion, hollow-stem auger and sonic core drilling methods. The borehole geophysical logging methods of spontaneous potential, resistivity, nuclear (natural gamma, gamma-gamma and neutron) and sonic were used locate areas (aquifers) of high subsurface contaminant transport. Upon completion of the field investigation, was responsible for providing evaluation and interpretation of soil and groundwater chemical data for presentation in the AFI RI report. The AFI project was successful in its task of delineating groundwater and soil contaminant (vinyl chloride, DCE, TCE, PCE, JP-4, diesel, gasoline, and BTEX) plume boundaries in the vicinity of Mather AFB.

Accomplishments:
Greatly contributed to $17.8M fixed-price project being completed in under $10.0M resulting in approximately $7.8M company profit.

Lead Hydrogeologist, Mather Air Force Base, US Air Force (AFCEE), Sacramento, CA, $6,000,000.00, 06/1992 - 12/1992
Lead Field Hydrogeologist, Group 3 RI/FS Project, Mather AFB, Sacramento, California (June 1992-December 1992).
Provided technical oversight and supervision for the field investigation associated with the $6-million AFCEE CERCLA RI/FS project. This position included technical oversight of drilling operations and supervision for a field staff of up to ten associates as well as management, scheduling, and oversight of project subcontractors and their contracts.

Lead Hydrogeologist, Mather Air Force Base, US Air Force (AFCEE), San Francisco, 12/1991 - 06/1992
CERCLA Quarterly Monitoring Report, Mather AFB, Sacramento, California (December 1991-June 1992).

Preparation and submittal of the Mather AFB CERCLA quarterly monitoring report for AFCEE. Provided evaluation, interpretation, and presentation of contract laboratory analytical results and groundwater hydrogeologic data collected during Mather AFB quarterly groundwater sampling events. The Mather AFB CERCLA quarterly monitoring report provides an historical summary of Mather AFB groundwater contamination as well as providing a background to support future Mather AFB technical/management decisions.

Lead Hydrogeologist, Mather Air Force Base, US Air Force (AFCEE), Sacramento, CA, 08/1990 - 02/1991
Lead Field Hydrogeologist/Project Management Staff, RI/FS and SWAT Project, Mather AFB, Sacramento, California (1990-1991).
Provided technical oversight and supervision for the field investigation associated with the AFCEE CERCLA RI/FS and SWAT project. This included drilling operations, technical oversight and supervision for a field staff of up to ten associates, and management, scheduling, and oversight of project subcontractors and their contracts.

Project Hydrogeologist, McClellan AFB, US Air Force (AFCEE), Davis, CA, 12/1989 - 04/1990
Field Hydrogeologist, RI/FS Project, McClellan AFB, Davis, California (1988-1990).
Provided technical oversight and supervision for the field investigation associated with the AFCEE RI/FS project. This included drilling operations, aquifer testing, technical oversight and supervision for a field staff of up to ten associates, and management, scheduling, and oversight of project subcontractors and their contracts.

Project Hydrogeologist, Castle Air Force Base, US Air Force (AFCEE), Atwater, CA, 06/1988 - 03/1990
Field Hydrogeologist, RI/FS Project, Castle AFB, Atwater, California (1988-1990).
Provided technical oversight and supervision for the field investigation associated with the AFCEE RI/FS project. This included drilling operations, aquifer testing, technical oversight and supervision for a field staff of up to ten associates, and management, scheduling, and oversight of project subcontractors and their contracts.

Project Hydrogeologist, Champion International, Champion International, Salinas, CA, 10/1987 - 04/1989
Engineer/Scientist I, IT Corporation, Martinez, California.
As assistant project hydrogeologist/sample coordinator at the Champion International Groundwater Treatment Facility in Salinas, California, coordinated groundwater monitoring sampling and analysis program (SAP) for the industrial site remediation projects. Responsibilities also included collecting monitoring well and treatment plant samples, maintaining and operating treatment plant, conducting pump test aquifer studies, performing hydrogeologic data interpretation, contributing to the location, design, and installation of the intermediate aquifer groundwater extraction well system, performing monitoring well installation and abandonment; and serving as agricultural, domestic, industrial, and municipal well owner liaison.

Project Hydrogeologist, Firestone, Firestone, Salinas, CA, 10/1987 - 04/1989
Engineer/Scientist I, IT Corporation, Martinez, California
As assistant project hydrogeologist/sample coordinator at the Firestone Groundwater Treatment Facility in Salinas, California, coordinated groundwater monitoring sampling and analysis program (SAP) for the industrial site remediation projects. Responsibilities also included collecting monitoring well and treatment plant samples, maintaining and operating treatment plant, conducting pump test aquifer studies, performing hydrogeologic data interpretation, contributing to the location, design, and installation of the intermediate aquifer groundwater

extraction well system, performing monitoring well installation and abandonment; and serving as agricultural, domestic, industrial, and municipal well owner liaison.

01/1994 - 06/1997
Task Manager, IT Corporation, Martinez, California

Responsibilities include providing support to government and commercial client projects and office staff as a Task Manager. Also responsible for business development and managing and contributing to project proposals.

The following is a summary of key projects:
<u>Task Manager, Presidio of San Francisco,, United States Army Corps of Engineers (USACE), San Francisco, CA, $10,000,000.00, 03/1996 - 06/1997</u>
As Task Manager of the $10 million United States Army Corps of Engineers (USACE) Fuel Distribution System (FDS). For the FDS Removal project at the Presidio of San Francisco National Park, was responsible for managing a technical and labor force of up to 40 associates to remove and dispose of over 40,000 linear feet of FDS pipeline and its associated petroleum-impacted (petroleum hydrocarbons, heating oil, BTEX) soils. Project responsibilities included cost analysis, technical oversight and supervision for a technical and labor force of up to 40 associates, as well as management, scheduling, oversight of project subcontractors and their contracts, and coordination and scheduling of removal operations to comply and cooperate with ongoing Presidio of San Francisco National Park Service (NPS) activities

<u>Task Manager, Mather Air Force Base, , US Air Force (AFCEE), Sacramento, CA, $8,000,000.00, 01/1995 - 06/1996</u>
Accomplished dual-role of Task Manager/Field Operations Coordinator for the $8 million AFCEE Additional Site Characterization (ASC) CERCLA RI/FS project at Mather AFB, Sacramento, CA. Position included managing a field staff of up to 20 associates, managing and overseeing project subcontractors and their contracts, performing Air Force/Client/Regulatory liaison, and QA/QC and Health and Safety program enforcement. Responsibilities also included generating bid proposals, writing work plans and assisting in the data evaluation and interpretation for proposed Mather AFB closure plans presented in the ASC report. The project accomplished AFCEE? s goal of locating the groundwater contaminants of concern (vinyl chloride, DCE, TCE, PCE, JP-4, diesel, gasoline, and BTEX) for future remediation. The characterization required accessing the subsurface with air rotary/casing hammer (ARCH), mud rotary, dual-tube percussion, hollow-stem auger and sonic core drilling methods. The borehole geophysical logging methods of spontaneous potential, resistivity, nuclear (natural gamma, gamma-gamma and neutron) and sonic were used locate areas (aquifers) of high subsurface contaminant transport.

Accomplishments:
Zero lost work day incidents. Zero vehicle accidents.

<u>Task Manager/Project Hydrogeologist, Northern California Hazardous Waste Disposal Sites, International Technology Corporation (IT Corp), Martinez, CA, 01/1994 - 01/1995</u>
Served as Project Hydrologist/Task Manager in the Northern California Sites Division, Groundwater Programs Group. Managed Comprehensive Groundwater Monitoring Evaluation (CME) and Class 1 landfill closure projects in compliance with California Department of Toxic Substances Control (DTSC) regulations. Position required continual hydrogeologic data monitoring and interpretation and report writing in a support of this division's efforts to close four Northern California area Class 1 landfill facilities under RCRA.

Accomplishments:
1994 National Quality Award

01/1991 - 12/1996
Field Operations Coordinator, IT Corporation, Martinez, California

Responsibilities include providing support to government and commercial client projects and office staff as a Field Operations Coordinator.

The following is a summary of key projects:
Field Operations Coordinator, Mather Air Force Base,, US Air Force (AFCEE), Sacramento, CA, $1,000,000.00, 01/1992 - 12/1992
Field Operations Coordinator/Lead Geologist, Project Management Staff, Mather AFB Landfill Gas Operable Unit/FS project in Sacramento, California Responsible for coordinating all aspects of the field investigation associated with the $1-million AFCEE landfill gas OU/FS project. Managed a field staff of up to 15 associates, managed and oversaw project subcontractors and their contracts, performed Air Force/client/regulatory liaison, and enforced QA/QC and Health and Safety program enforcement. Responsibilities also included generating bid proposals, writing work plans, and assisting in data evaluation and interpretation for the Mather AFB proposed landfill closure plans presented in the landfill gas OU/FS report.

Field Operations Coordinator, Mather Air Force Base,, US Air Force (AFCEE), Sacramento, CA, $20,000,000.00, 11/1990 - 03/1991
Field Operations Coordinator/Project Management Staff, Group 2 RI/FS and Solid Waste Water Quality Assessment Test (SWAT) Projects, Mather AFB, Sacramento, California
Responsible for coordinating all aspects of the field investigation associated with the $20-million AFCEE CERCLA RI/FS and SWAT projects. Position responsibilities included managing a field staff of up to 20 associates, managing and overseeing project subcontractors and their contracts, serving as Air Force/client/regulatory agency liaison, and enforcing QA/QC and health and safety programs. Responsibilities also included generating bid proposals, writing work plans, and providing hydro-geologic data evaluation, interpretation, and presentation for CERCLA RI/FS reports.

01/1987 - 06/1989
Sample Coordinator, IT Corporation, Martinez, California

Responsibilities include providing support to government and commercial client projects and office staff as a Sample Coordinator.

The following is a summary of key projects:
Sample Coordinator, Firestone, Firestone, Salinas, CA, 10/1987 - 04/1989
Engineer/Scientist I, IT Corporation, Martinez, California
As assistant project hydrogeologist/sample coordinator at the Firestone Groundwater Treatment Facility in Salinas, California, coordinated groundwater monitoring sampling and analysis program (SAP) for the industrial site remediation projects. Responsibilities also included collecting monitoring well and treatment plant samples, maintaining and operating treatment plant, conducting pump test aquifer studies, performing hydrogeologic data interpretation, contributing to the location, design, and installation of the intermediate aquifer groundwater extraction well system, performing monitoring well installation and abandonment; and serving as agricultural, domestic, industrial, and municipal well owner liaison.

Sample Coordinator, Champion International, Champion International, Salinas, CA, 10/1987 - 04/1989
Engineer/Scientist I, IT Corporation, Martinez, California
As assistant project hydrogeologist/sample coordinator at the Champion International Groundwater Treatment Facility in Salinas, California, coordinated groundwater monitoring sampling and analysis program (SAP) for the industrial site remediation projects. Responsibilities also included collecting monitoring well and treatment plant samples, maintaining and operating treatment plant, conducting pump test aquifer studies, performing hydrogeologic data interpretation, contributing to the location, design, and installation of the intermediate aquifer groundwater extraction well system, performing monitoring well installation and abandonment; and serving as agricultural, domestic, industrial, and municipal well owner liaison.

05/1985 - 08/1987
Firefighter, US Forest Service, Mendocino County, California

Wild lands Firefighter

The following is a summary of key projects:
Firefighter, Wild lands Fire, Mendocino National Forest, CA, Western United States, 05/1985 - 10/1988
US Forest Service Firefighter throughout the Western United States.

01/1986 - 06/1987
Sample Coordinator, Butte County Planning Department, Oroville, California

Responsibilities include coordinating and collecting groundwater samples from domestic water wells as part of the Butte County Planning Department’s groundwater study.

The following is a summary of key projects:
Sample Coordinator, Butte County Aquifer Study, Butte County Planning Department, Oroville, CA, 12/1986 - 06/1987
Responsibilities include coordinating and collecting groundwater samples from domestic water wells as part of the Butte County Planning Department’s groundwater study.

Awards/Honors

President's Safety Award, Shaw Environmental and Infrastructure, Inc., 2010
President's Award, Shaw Environmental and Infrastructure, Inc, 2004
LEHR Project Health and Safety Award, Weiss Associates, 1999
Health and Safety-3rd Quarter 1995, International Technology Corporation, 1995
National Quality Award-Northern California Sites Groundwater Group, International Technology Corporation-Quality and Health Services, 1994
National Quality Award-Firestone Project, Salinas, CA, International Technology Corporation-Quality and Health Services, 1988

Publications/Presentations

Kevin O'Leary, William Schaal, Survival Techniques for Subcontractors, Association of Engineering Geologists 46th Annual Meeting, Vail, CO, 2003

Kevin O'Leary, William Schaal, Douglas Brown, Innovative Radioactive Contamination Controls

in Rapid Site Assessments, University of Massachusetts 14th Annual Conference on Contaminated Soils, October 1998, Amherst, MA, 1998

Other Information

Languages
Language: Speak Read Write
Spanish: Moderate, Slight, Slight

Years of Experience
Previous Employers: 1.00
CB&I: 27
Total of 28.00 year(s) experience

Experience in EPA Regions
Region 5 (IL IN MI MN OH WI)
Region 9 (AZ CA HI NV American Samoa, Guam, TT)

Industry Experience
Environmental

(b) (6) [redacted]

(b) (6) [redacted]

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

KEVIN J. O'LEARY

#SPK511501065

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

SACRAMENTO, CA	3/19-3/20/15	SACRAMENTO/SPK	DREW A. PERRY
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
DREW A. PERRY	DREW.A.PERRY@USACE.ARMY.MIL	(916) 557-7779	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Director, USACE Learning Center

Last Updated: 04 Oct 2017

Natalie Rothell

Professional Qualifications

Ms. Rothell has more than 6 years providing environmental engineering including O&M, LTM, system optimization, well installation/replacement, well abandonment, waste minimization, and CERCLA removal and remedial actions at several active and closed military installations; and over 3 years of environmental task order management experience including site assessments, remedial investigations, soil and groundwater design and remediation, pipeline abandonment, well installation and destruction, air quality compliance, quality control management, and site health and safety.

Education

Bachelor of Engineering, Civil Engineering - geotechnical and transportation, California Polytechnic State University, San Luis Obispo, California, [redacted]

Additional Training/Continuing Education

QCM Training, NAVFAC SW, 2017
8- Hour Hazardous Waste Operations and Emergency Response Training Refresher, Compliance Solutions, 2017
Competent Person, Fall Protection, CB&I, 2017
C3 Competent Person, Excavations, ClickSafety, 2016
OSHA 30 Hour Construction, ClickSafety, 2016
CPR and First Aid, Red Cross, 2015
40-Hour Hazardous Waste Operations and Emergency Response Training, Cuyamaca College, 2010

Registrations/Certifications/Licenses

Professional Engineer, Civil, 2016, 86374, Active, California, 03/2019
Engineer in Training, 2009, 137348, Active, California

[redacted]

Experience and Background

07/2017 - Present
Project Engineer, Aptim Federal Services, Federal Services, San Diego, California

Project engineer and task order manager on various environmental remediation projects on both active and inactive bases. Experiend performing project site roles: QA/QC, SSHO, and field engineer. Currently manages several task orders and is responsible for reporting monthly production, invoices, % to completion, scheduling, regulatory and public relations, and overseeing project staff on all phases of work.

The following is a summary of key projects:
Task Order Manager, Operation and Maintenance and Long Term Monitoring at IRP Sites 1 and 2, 500807, NAVFAC SW, MCAS El Toro, $559,432.00, 09/2016 - Present
Complete Year 3 O&M activities at IRP Sites 1 and 2 at former MCAS El Toro. Team was tasked with semiannual sampling events and reporting. Project is part of the mentor/protege teaming task with NOREAS. As task order manager, Ms. Rothell is responsibly for overseeing field team, finalizing technical reports, providing MSR and invoices for work complete, and forecasting upcoming work/costs.

Accomplishments:
Awarded Option 01 - Additional Year (Year 4) of O&M

Awards/Client Commendations:
No comment

Other Comments:
No comment

11/2010 - 06/2017
Project Engineer, CB&I, Federal Services, San Diego, California

Project engineer on various environmental and construction jobs that range from soil excavation/remediation to SVE installation and operation. Tasks for jobs include project plan development; proposal preparation; subcontractor scope developement, evaluation of bids, scheduleing, and work verification; quality control; quality assurance; health and safety oversite; SWPPP implementation; site management; sample collection/analysis; and report development and management. Miss Rothell has executed the roll of Quality Control Manager and Site Safety and Health Officer on several projects in the San Diego and San Francisco areas as well as taken on the roll of technical lead, site supervisor, and task order manager.

The following is a summary of key projects:
Project Engineer/QCM/SSHO, Site 12 TCRA: Halyburton Ct, Gateview Ave, and Mason Ct, 500565, NAVFAC SW, Treasure Island, San Francisco, CA, 04/2016 - Present
Complete the demolition of 8 buildings at three sites within IR Site 12 on Treasure Island to facilitate the excavation, removal, remediation and restoration of three areas of contamination due to historical military operations on TI. Due to the nature of the site, not only is remediation being completed for chemical constituents, but also for potential radiological contamination.

Project Engineer/QCM, Removal of Historic Avenue N Wood Stave Pipeline, 500475, NAVFAC SW, Treasure Island, San Francisco, CA, $796,519.00, 11/2015 - Present
CB&I was tasked with investigating and removing a wooden pipeline that was left in place following the decommisioning and deconstruction of Building 233. The pipeline, which was located beneath a swale, was excavated, investigated/sampled for potential radiation contamination, and was then disposed of with its associated materials (soil, metal, and concrete). Following excavation, the swale was restored to bring the site back to its original conditions.

Accomplishments:
Within the project trench excavation area, several high volt and communication lines were direct buried and could not be disconnected. Through successful site management and understanding throughout the project team, these lines were avoided and the project was completed successfully.

Due to the location of the project, the project was under high scrutiny by the public, regulators and client. All three groups were satisfied with the work completed, findings, and the site restoration.

Project Engineer, MCBCP Operational Range Clearance and Sustainability Activities, 500301, NAVFAC SW, Marine Corps Base Camp Pendleton, 06/2015 - Present
Performing surface range clearances of ranges and LFAM in order to maintain operational range safety and prevent the accumulation of ordnance scrap and target debris from impairing or preventing continued operational range use.

Project Engineer/Technical Lead, Bioremediation and SVE at IR Sites 10 and 12, 500216, NAVFAC SW, SPAWAR OTC, 01/2015 - Present
Investigate and remediate
potential soil vapor contamination at SPAWAR OTC at sites 10 and 12. Completed the installation of additional soil vapor wells, monitoring well, and two additions to the existing Soil Vapor Extraction System network on site. Installed and continue to conduct operation and maintenance checks on the SVE System which is currently running to extract the potentially TCE soil vapor that was due to a residual plume beneath Building 3 due to historical uses of that building.

Project Engineer, Site 12 Radiological Site Assessment and Removal, 500060, BRAC PMO, Naval Station Treasure Island, San Francisco CA, 01/2014 - Present
Excavation and radiological assessment at three distinct sites (SWDAs) within Site 12 at Naval Station Treasure Island with the goal of removing/controlling all LLRO/LLRW that was residual from previous military uses. Due to the location of the three project sites involved with this work, the work being completed is under high public, regulator, and client scrutiny.

Awards/Client Commendations:
N/A

Other Comments:
N/A

Project Engineer, Remedial Action Completion of Parcel C (Excluding RU-C2), 140368, NAVFAC SW, Hunters Point Naval Shipyard, 07/2012 - Present
Remedial action cleanup of Parcel C, excluding RU-C2, included the excavation, sampling and site restoration of various areas, groundwater well installation and monitoring, groundwater and soil vapor remediation, and the installation of several SVE systems site wide. Many locations presented challenges due to site geological conditions, existing dilapidated buildings, and extensive subsurface structures.

Project Engineer/Team Lead, Site 12 Radiological Housing Survey, 500191, BRAC PMO, Naval Station Treasure Island, San Francisco, CA, 06/2014 - 12/2015
Radiological housing survey of all ground floor housing units within Site 12 to assess the current conditions; and if found, remove LLRO that may be present below the foundations of the buildings to prevent any long term exposure to the residents.

Accomplishments:
Completed project ahead of schedule and on budget which reduced the impact to the residents of the units that were surveyed. The teams performed in an efficient manner that supplied thorough and complete surveys of each unit contracted while maintaining the integrity of the unit and the

residents' personal belongings. Miss Rothell as a team lead in the field and a technical lead preparing presentation for regulators and public, preparing weekly reports, and finalizing the data in the final closeout report.

Awards/Client Commendations:
Star Safety Excellence Award

06/2015 - 06/2013
Engineer I, Shaw Environmental & Infrastructure, Inc., San Diego, California

Responsibilities include providing increasing technical support in the office and in the field to project managers and the team, lead site assessments, facilitate communication with subcontractors on site, maintain the appropriate paperwork for the project, attain permits for projects as needed, and prepare/submit intermediate and final reports for the work done.

The following is a summary of key projects:
<u>Project Engineer/QCM, Removal of Historic Avenue N Wood Stave Pipeline, 500475, NAVFAC SW, Treasure Island, San Francisco, CA, $796,519.00, 11/2015 - Present</u>
CB&I was tasked with investigating and removing a wooden pipeline that was left in place following the decommisioning and deconstruction of Building 233. The pipeline, which was located beneath a swale, was excavated, investigated/sampled for potential radiation contamination, and was then disposed of with its associated materials (soil, metal, and concrete). Following excavation, the swale was restored to bring the site back to its original conditions.

Accomplishments:
Within the project trench excavation area, several high volt and communication lines were direct buried and could not be disconnected. Through successful site management and understanding throughout the project team, these lines were avoided and the project was completed successfully. Due to the location of the project, the project was under high scrutiny by the public, regulators and client. All three groups were satisfied with the work completed, findings, and the site restoration.

<u>Project Engineer, Lead Shot and Impacted Soil Removal Munitions Response Site 5, 130409, MCAS Miramar, San Diego County, 09/2011 - Present</u>
Due to the extensive debris left behind at the shooting range located at Munitions Response Site 5, site remediation needed to be done in order to remediate the lead, arsenic and PAHs contamination on the surround environment. Taking the sampling results from a previous site assessment of the project location, pre-sampling the site, conducting a range sweep, and post sampling will be done and reported. Due to the sensitivity of several species that now inhabit the unused shooting range, the range clearance will be conducted within a short window of time while ensuring that minimal environmental disturbance occurs.

<u>Technical Support, Fueling Pit 13 Assessment - MCAS Miramar, 139254, MCAS Miramar, San Diego County, 11/2010 - Present</u>
A subsurface hydrocarbon assessment was conducted at Fueling Pit 13 after a leak was discovered. Horizontal and vertical delineation of the fuel contamination was attained through the installation and survey over time of monitoring wells on site. Soil borings from the installation of the wells were analyzed and results for air, soil, and groundwater findings were reported.

<u>Project Engineer, PCB Hot Spot Area at Parcel E-2, 136027, Hunters Point Shipyard, San Francisco County, 12/2011 - 12/2013</u>

This project facilitated the removal of Tier 1, Tier 2, Tier 3, and Tier 5 hot spot excavation areas that were a potential source of contamination to aquatic wildlife in San Francisco Bay, and were greater than risk-based evaluation criteria. Excavations went down until confirmation samples met the evaluation criteria or until a depth of 10 feet was reached. Soil was screened for MPPEH and radiological data. Air monitoring occurred throughout the duration of the project until demobilization due to the close proximity of a residential area.

Project Engineer, Closure of the UST Fuel Piping, 144060, MCAS Miramar, San Diego County, 11/2011 - 12/2013

The sampling and closure of a UST fuel piping system no longer in use by the base. The piping runs through several facilities and requires in depth scheduling with base activities and environmental factors. A unique sampling plan was derived so as to best characterize the soil surrounding the pipe while working well with the base activities and environmental concerns presented along different portions of the piping system.

Technical Support, Subsurface Hydrocarbon Assessment at Assault Craft Unit 5, 139256, Marine Corp - Camp Pendleton, Camp Pendleton, 11/2010 - 12/2013

Subsurface hydrocarbon assessments were conducted at Assault Craft Unit 5 after a leak was discovered at one of their fueling stations. Horizontal and vertical delineation of the fuel contamination was attained through the installation and survey over time of monitoring wells on site. Soil vapor was also sampled due to the close proximity of several on-site buildings. Soil borings from the installation of the wells were characterized. The results for air, soil, and groundwater findings were reported. Ongoing monitoring and purging of the monitoring wells is occurring periodically until further action takes place.

Technical Support, Installation Restoration Site 2 at the Former Spanish Bight Municipal Landfill, 142895, Naval Air Station North Island, San Diego County, 08/2011 - 11/2011

Implementation included site grading to flatten slopes to not more than 2 horizontal to 1 vertical, installing BMPs such as hydroseeding with native seed and fiber rolls, until the vegetation can take root and provide erosion mitigation, installing a low height retaining wall along the full length of the problem areas in order to flatten the slope, installing brow ditches and down-drains to collect runoff on site, and submitting the final site closure report to the Navy.

Technical Support, EPCRA Section 311/312 Reporting, 142054, Naval Air Weapons Station, China Lake, Kern County, 04/2011 - 06/2011

Identify locations and quantity of any individual hazardous material, hazardous waste, petroleum product, or animal fat that exceeded California EPCRA 312 thresholds. The type, amount and storage conditions for each material were documented, photographed, and GPS coordinated were noted. Diagrams were drawn to depict the location of the material within the facility and the direction of flow of material in the event of a spill. Drains, ditches, sewers or bodies of water that could be in the path of the spill were also noted. ASTs as well as any known USTs were documented. All information was compiled into a single report for the Base's use.

Technical Support, Range Clearance at Multiple Training Ranges, 133560, MCB Camp Pendleton, San Diego County, 11/2010 - 05/2011

Performed range clearances of several training ranges in order to maintain operational range safety and prevent the accumulation of ordnance scrap and target debris from impairing or preventing continued operational range use. The clearances also served as a benchmark for future range clearance operations. Quantities of scrap metal and target debris were documented as well as any live material that was destroyed were identified on maps of the ranges and reported in the final closure reports for each range.

Accomplishments:
Fifteen ranges were swept by the UXO teams. Their findings were compiled into individual reports for each range with documentation showing where the items were found, what the items were, and the frequency in which they occurred.

Professional Affiliations

American Society of Civil Engineers, Member, 2005

Natalie Rothell

Title: Engineer 2
Employee Number: [redacted]
Location: San Diego, CA
Location2: Columbia St
Business Unit: AS&E West, Home
Company: APTIM Federal Services

Contact Information

Work Phone: 619.533.7337

Skills

Group: BUSINESS ADMINISTRATION SPECIALTIES
Category: BUSINESS DEVELOPMENT
Skill/Experience Level: Presentations : Working Knowledge
Category: PROPOSALS
Skill/Experience Level: Project Descriptions : Working Knowledge
Skill/Experience Level: Proposal Development/Preparation : Working Knowledge
Skill/Experience Level: Scope of Work Analysis : Working Knowledge
Skill/Experience Level: Technical Writing : Working Knowledge

Group: COMPUTER/INFORMATION TECHNOLOGY SPECIALTIES
Category: COMPUTER APPLICATIONS (User)
Skill/Experience Level: Adobe Illustrator : Working Knowledge
Skill/Experience Level: Adobe Photoshop : Working Knowledge
Skill/Experience Level: CADD-AutoCAD : Fundamental Knowledge
Skill/Experience Level: GIS : Fundamental Knowledge
Skill/Experience Level: Microsoft Access : Fundamental Knowledge
Skill/Experience Level: Microsoft Excel : Senior
Skill/Experience Level: Microsoft Power Point : Senior
Skill/Experience Level: Microsoft Word : Senior
Skill/Experience Level: Windows 98 : Working Knowledge
Skill/Experience Level: Windows Vista: Working Knowledge
Skill/Experience Level: Windows XP : Working Knowledge

Group: CONSTRUCTION/REMEDIATION SPECIALTIES
Category: CONSTRUCTION/REMEDIATION
Skill/Experience Level: Backfilling : Working Knowledge
Skill/Experience Level: Civil Construction : Working Knowledge
Skill/Experience Level: Clean Construction : Working Knowledge
Skill/Experience Level: Compaction : Working Knowledge
Skill/Experience Level: Concrete : Fundamental Knowledge
Skill/Experience Level: Construction Management : Working Knowledge
Skill/Experience Level: Demolition : Fundamental Knowledge
Skill/Experience Level: Estimating : Working Knowledge
Skill/Experience Level: Excavation : Working Knowledge
Skill/Experience Level: Field Inspection : Working Knowledge
Skill/Experience Level: Fixation/Stabilization : Fundamental Knowledge

Skill/Experience Level: General Construction : Fundamental Knowledge
Skill/Experience Level: Lead-Based Paint Abatement : Working Knowledge
Skill/Experience Level: Munitions & Explosives of Concern (MEC) Disposal: Fundamental Knowledge
Skill/Experience Level: Operation/Maintenance : Working Knowledge
Skill/Experience Level: Oversight : Working Knowledge
Skill/Experience Level: Piping : Fundamental Knowledge
Skill/Experience Level: Shoring : Fundamental Knowledge
Skill/Experience Level: Site Remediation : Working Knowledge
Skill/Experience Level: Sludge Stabilization/Dewatering : Fundamental Knowledge
Skill/Experience Level: Soil Handling/Testing : Working Knowledge
Skill/Experience Level: Stabilization : Fundamental Knowledge
Skill/Experience Level: System Dismantling : Fundamental Knowledge
Skill/Experience Level: System Installation : Fundamental Knowledge
Skill/Experience Level: Transportation and Disposal : Working Knowledge
Skill/Experience Level: Trenching : Fundamental Knowledge
Category: GENERAL/SKILLED LABOR
Skill/Experience Level: Concrete Finishing : Fundamental Knowledge
Skill/Experience Level: Heavy Equipment Operation : Fundamental Knowledge

Group: CONSULTING SPECIALTIES
Category: ASSESSMENT/EVALUATION
Skill/Experience Level: Contaminant Migration : Working Knowledge
Skill/Experience Level: Contaminated Sediments : Fundamental Knowledge
Skill/Experience Level: Hazard Evaluation : Fundamental Knowledge
Skill/Experience Level: Noise/Traffic Evaluation : Working Knowledge
Skill/Experience Level: Radiological Surveys : Working Knowledge
Skill/Experience Level: Risk Assessment - Ecological: Fundamental Knowledge
Skill/Experience Level: Risk Assessment - Human Health: Fundamental Knowledge
Skill/Experience Level: Waste Characterization : Working Knowledge
Category: AUDITS
Skill/Experience Level: Environmental : Fundamental Knowledge
Skill/Experience Level: Health & Safety : Working Knowledge
Skill/Experience Level: Quality Assurance : Working Knowledge
Category: CONSULTING
Skill/Experience Level: EH&S Management : Fundamental Knowledge

Group: ENVIRONMENTAL SPECIALTIES
Category: AIR
Skill/Experience Level: Air Quality : Fundamental Knowledge
Skill/Experience Level: Analysis : Working Knowledge
Skill/Experience Level: Climatology : Fundamental Knowledge
Skill/Experience Level: Emissions Testing/Control/Measurement : Fundamental Knowledge
Skill/Experience Level: Indoor Air : Fundamental Knowledge
Skill/Experience Level: Meteorological Monitoring Systems : Fundamental Knowledge
Skill/Experience Level: Odor Control : Fundamental Knowledge
Skill/Experience Level: Perimeter Monitoring : Working Knowledge
Skill/Experience Level: Permitting : Working Knowledge
Skill/Experience Level: Regulatory Compliance : Working Knowledge
Skill/Experience Level: Testing : Working Knowledge
Category: ANALYTICAL

Skill/Experience Level: Data Management : Working Knowledge
Skill/Experience Level: Data Validation : Fundamental Knowledge
Skill/Experience Level: Field Analytical Methods : Working Knowledge
Skill/Experience Level: Geotechnical Testing : Working Knowledge
Skill/Experience Level: Laboratory Analytical Methods : Working Knowledge
Category: COMMUNITY INVOLVEMENT
Skill/Experience Level: Community Interviews : Fundamental Knowledge
Skill/Experience Level: Newsletters/Fact Sheets : Working Knowledge
Skill/Experience Level: Public Interaction : Working Knowledge
Skill/Experience Level: Public Notices/Press Releases : Working Knowledge
Skill/Experience Level: Questionnaire/Interview Form Development : Working Knowledge
Skill/Experience Level: Workshops : Fundamental Knowledge
Category: COMMUNITY RELATIONS
Skill/Experience Level: Advertising/Brochures : Working Knowledge
Skill/Experience Level: Community Relations : Working Knowledge
Skill/Experience Level: Community Right-to-Know : Fundamental Knowledge
Skill/Experience Level: Media Interaction : Working Knowledge
Skill/Experience Level: Presentations : Working Knowledge
Skill/Experience Level: Public Meetings/Involvement : Working Knowledge
Skill/Experience Level: RABs : Working Knowledge
Skill/Experience Level: Symposiums/Seminars : Fundamental Knowledge
Category: REGULATORY
Skill/Experience Level: Analysis : Working Knowledge
Skill/Experience Level: CERCLA : Fundamental Knowledge
Skill/Experience Level: Clean Air Act : Fundamental Knowledge
Skill/Experience Level: Clean Water Act : Fundamental Knowledge
Skill/Experience Level: Community Right-to-Know: Working Knowledge
Skill/Experience Level: Compliance : Working Knowledge
Skill/Experience Level: Hazardous Waste Evaluation : Working Knowledge
Skill/Experience Level: Permitting : Working Knowledge
Skill/Experience Level: RCRA Closure Plans : Working Knowledge
Skill/Experience Level: RCRA Compliance : Working Knowledge
Skill/Experience Level: Spill Plans : Fundamental Knowledge
Category: WASTE MINIMIZATION/POLLUTION PREVENTION
Skill/Experience Level: Recycling : Fundamental Knowledge
Skill/Experience Level: Volume Reduction : Fundamental Knowledge
Skill/Experience Level: Waste Minimization/Pollution Control : Fundamental Knowledge

Group: FACILITY MANAGEMENT-SRM/MISSION SUPPORT SERVICES
Category: BUSINESS OPERATIONS
Skill/Experience Level: Procurement : Working Knowledge
Skill/Experience Level: Quality Control : Working Knowledge
Skill/Experience Level: Safety Management : Working Knowledge
Category: ENVIRONMENTAL SERVICES
Skill/Experience Level: Hazardous Waste Handling, Storage & Disposal : Working Knowledge
Skill/Experience Level: Laboratory Services : Working Knowledge
Category: VEHICLE/EQUIPMENT O&M
Skill/Experience Level: Vehicle Maintenance : Fundamental Knowledge
Skill/Experience Level: Vehicle Operations : Working Knowledge

Group: FIELD SERVICES SPECIALTIES

Category: ABOVEGROUND STORAGE TANKS
Skill/Experience Level: Aboveground Storage Tanks : Fundamental Knowledge
Skill/Experience Level: Closure : Fundamental Knowledge
Category: ASBESTOS
Skill/Experience Level: Abatement : Working Knowledge
Skill/Experience Level: Asbestos : Working Knowledge
Skill/Experience Level: Assessment : Fundamental Knowledge
Skill/Experience Level: Monitoring : Fundamental Knowledge
Skill/Experience Level: Survey : Fundamental Knowledge
Skill/Experience Level: Testing : Fundamental Knowledge
Category: DRILLING
Skill/Experience Level: Borings : Working Knowledge
Skill/Experience Level: Drilling : Working Knowledge
Skill/Experience Level: Gas Well Abandonment: Fundamental Knowledge
Skill/Experience Level: Gas Well Plugging: Working Knowledge
Skill/Experience Level: Horizontal Drilling : Fundamental Knowledge
Skill/Experience Level: Monitoring Well Installation : Working Knowledge
Category: DRUMS
Skill/Experience Level: Testing : Working Knowledge
Skill/Experience Level: Waste Characterization : Working Knowledge
Skill/Experience Level: Waste Disposal & Shipping : Working Knowledge
Category: EQUIPMENT SKILLS
Skill/Experience Level: Man Lifts: Fundamental Knowledge
Category: OPERATIONS AND MAINTENANCE
Skill/Experience Level: Bioremediation Systems : Fundamental Knowledge
Skill/Experience Level: Manuals/Procedures : Working Knowledge
Skill/Experience Level: Soil Vapor Extraction Systems : Working Knowledge
Category: SAMPLING
Skill/Experience Level: Aboveground Storage Tanks : Fundamental Knowledge
Skill/Experience Level: Air : Working Knowledge
Skill/Experience Level: Asbestos : Fundamental Knowledge
Skill/Experience Level: Drilling : Working Knowledge
Skill/Experience Level: Drums : Working Knowledge
Skill/Experience Level: Fixed Laboratory Analysis : Fundamental Knowledge
Skill/Experience Level: Mobile Laboratory Analysis : Fundamental Knowledge
Skill/Experience Level: Sampling : Working Knowledge
Skill/Experience Level: Soil : Working Knowledge
Skill/Experience Level: Underground Storage Tanks : Fundamental Knowledge
Skill/Experience Level: Wipe : Fundamental Knowledge
Category: SURVEY
Skill/Experience Level: Aerial Surveys : Fundamental Knowledge
Skill/Experience Level: As-built Mapping : Fundamental Knowledge
Skill/Experience Level: Boundary : Fundamental Knowledge
Skill/Experience Level: Construction Survey : Working Knowledge
Skill/Experience Level: Cross Section Survey : Fundamental Knowledge
Skill/Experience Level: Field Survey : Working Knowledge
Skill/Experience Level: GIS : Fundamental Knowledge
Skill/Experience Level: GPS Control : Fundamental Knowledge
Skill/Experience Level: Rights of Way : Fundamental Knowledge
Skill/Experience Level: Staking : Working Knowledge
Skill/Experience Level: Topographic : Working Knowledge

Skill/Experience Level: Utility Locates : Working Knowledge
Skill/Experience Level: Well Monitoring : Working Knowledge
Category: UNDERGROUND STORAGE TANKS
Skill/Experience Level: Testing : Fundamental Knowledge
Skill/Experience Level: Underground Storage Tanks : Fundamental Knowledge

Group: PROJECT MANAGEMENT SPECIALTIES
Category: CONSTRUCTION MANAGEMENT - SUBCONTRACTS ADMINISTRATION
Skill/Experience Level: Bid Analysis: Working Knowledge
Skill/Experience Level: Close Out Management: Working Knowledge
Skill/Experience Level: Risk Analysis: Fundamental Knowledge
Skill/Experience Level: Spreadsheet Development: Fundamental Knowledge
Skill/Experience Level: Subcontract Bid Evaluation: Working Knowledge
Skill/Experience Level: Subcontract Plan Development: Working Knowledge
Skill/Experience Level: Subcontract Pricing and Costing: Working Knowledge
Skill/Experience Level: Subcontractor Prequalification Review: Working Knowledge
Category: ENGINEERING PROJECT CONTROLS
Skill/Experience Level: Conceptual Planning & Scheduling : Working Knowledge
Skill/Experience Level: Construction Management Planning & Scheduling : Working Knowledge
Skill/Experience Level: Cost & Scheduling Analysis : Working Knowledge
Skill/Experience Level: Cost Forecasting : Fundamental Knowledge
Skill/Experience Level: Schedule Forecasting : Working Knowledge
Category: PROJECT CONTROLS
Skill/Experience Level: Estimating: Fundamental Knowledge
Skill/Experience Level: Risk Management: Fundamental Knowledge
Skill/Experience Level: Schedule Forecasting : Working Knowledge
Skill/Experience Level: Scheduling - Overall: Working Knowledge
Category: PROJECT MANAGEMENT
Skill/Experience Level: Budgets : Working Knowledge
Skill/Experience Level: Construction Management : Working Knowledge
Skill/Experience Level: Contract Administration : Fundamental Knowledge
Skill/Experience Level: Contract Management - Cost Reimbursable: Fundamental Knowledge
Skill/Experience Level: Contract Management - Firm Fixed Price: Fundamental Knowledge
Skill/Experience Level: Contract Management - T&M : Fundamental Knowledge
Skill/Experience Level: Cost/Scheduling : Working Knowledge
Skill/Experience Level: Emergency Planning : Fundamental Knowledge
Skill/Experience Level: Plan Development : Working Knowledge
Skill/Experience Level: Program Development/Management : Fundamental Knowledge
Skill/Experience Level: Project Management : Working Knowledge
Skill/Experience Level: Site Management : Working Knowledge
Skill/Experience Level: Technical/Report Writing : Working Knowledge

Group: TECHNICAL SPECIALTIES
Category: CONTAMINANT REMEDIATION
Skill/Experience Level: LNAPL : Fundamental Knowledge
Skill/Experience Level: Methane: Fundamental Knowledge
Skill/Experience Level: NAPL : Fundamental Knowledge
Skill/Experience Level: Ordnance/UXO/EOD : Fundamental Knowledge
Skill/Experience Level: PAH : Fundamental Knowledge
Skill/Experience Level: PCA : Fundamental Knowledge

Skill/Experience Level: PCBs : Fundamental Knowledge
Skill/Experience Level: PCE : Fundamental Knowledge
Skill/Experience Level: Pesticides : Fundamental Knowledge
Skill/Experience Level: Petroleum/Oil : Fundamental Knowledge
Skill/Experience Level: Radioactive Waste (i.e., Plutonium, Uranium, etc.) : Fundamental Knowledge
Skill/Experience Level: TCE : Fundamental Knowledge
Skill/Experience Level: TPH : Fundamental Knowledge
Category: ENGINEERING DESIGN - OVERALL
Skill/Experience Level: Civil Engineering : Fundamental Knowledge
Skill/Experience Level: Conceptual Design : Fundamental Knowledge
Skill/Experience Level: Cost Estimating : Fundamental Knowledge
Skill/Experience Level: Foundations : Fundamental Knowledge
Skill/Experience Level: Landfill Design : Fundamental Knowledge
Skill/Experience Level: Piles Foundations: Fundamental Knowledge
Skill/Experience Level: Remedial Design : Fundamental Knowledge
Skill/Experience Level: Soil Mechanics : Fundamental Knowledge
Skill/Experience Level: Water Treatment Systems: Fundamental Knowledge
Category: GEOLOGY
Skill/Experience Level: Erosion and Sediment Control : Fundamental Knowledge
Skill/Experience Level: Geologic Studies : Fundamental Knowledge
Skill/Experience Level: Geophysical Survey : Fundamental Knowledge
Skill/Experience Level: Geotechnical Studies : Fundamental Knowledge
Skill/Experience Level: Slope Analysis: Fundamental Knowledge
Category: GEOTECHNICAL ENGINEERING
Skill/Experience Level: Earthwork - Erosion and Sediment Control : Fundamental Knowledge
Skill/Experience Level: Earthwork - Field Support : Fundamental Knowledge
Skill/Experience Level: Earthwork - Site Preparation : Fundamental Knowledge
Skill/Experience Level: Earthwork - Slope Protection : Fundamental Knowledge
Skill/Experience Level: Field Coordination : Fundamental Knowledge
Skill/Experience Level: Site Investigations - Borings : Working Knowledge
Skill/Experience Level: Site Investigations - Field Support : Working Knowledge
Skill/Experience Level: Site Investigations - Surveying : Fundamental Knowledge
Skill/Experience Level: Testing & Monitoring - Laboratory Testing : Fundamental Knowledge
Category: HEALTH AND SAFETY
Skill/Experience Level: Accident Investigation : Working Knowledge
Skill/Experience Level: Construction : Working Knowledge
Skill/Experience Level: Health Physics : Working Knowledge
Skill/Experience Level: Manuals/Procedures : Working Knowledge
Skill/Experience Level: Noise : Working Knowledge
Skill/Experience Level: OSHA Reportables : Working Knowledge
Skill/Experience Level: Personnel Monitoring : Working Knowledge
Skill/Experience Level: Program Development : Working Knowledge
Skill/Experience Level: Site Safety/Health Officer : Working Knowledge
Category: INFRASTRUCTURE/TRANSPORTATION DESIGN
Skill/Experience Level: Calculations: Fundamental Knowledge
Skill/Experience Level: Infrastructure/Transportation: Fundamental Knowledge
Skill/Experience Level: Interchange Design : Fundamental Knowledge
Skill/Experience Level: Noise Impact Study : Fundamental Knowledge
Skill/Experience Level: Pavement Design : Fundamental Knowledge
Skill/Experience Level: Surveying: Fundamental Knowledge

Skill/Experience Level: Traffic Calming : Fundamental Knowledge
Skill/Experience Level: Traffic Engineering: Fundamental Knowledge
Skill/Experience Level: Traffic Modeling : Fundamental Knowledge
Skill/Experience Level: Traffic Safety: Fundamental Knowledge
Skill/Experience Level: Transit and Rail Stations: Fundamental Knowledge
Skill/Experience Level: Transportation Planning : Fundamental Knowledge
Category: NUCLEAR/RADIOLOGY
Skill/Experience Level: Analysis : Fundamental Knowledge
Skill/Experience Level: Low-Level Radiation : Fundamental Knowledge
Skill/Experience Level: Radiation Protection Training : Fundamental Knowledge
Skill/Experience Level: Site Remediation : Fundamental Knowledge
Category: QUALITY ASSURANCE
Skill/Experience Level: Analytical/Chemical Quality : Working Knowledge
Skill/Experience Level: Auditing : Working Knowledge
Skill/Experience Level: Construction : Working Knowledge
Skill/Experience Level: Engineering : Working Knowledge
Skill/Experience Level: Manuals/Procedures : Working Knowledge
Skill/Experience Level: Plan Preparation : Working Knowledge
Skill/Experience Level: Quality Control : Working Knowledge
Category: SITE INVESTIGATION
Skill/Experience Level: Aerial Photography Interpretation : Fundamental Knowledge
Skill/Experience Level: Excavation of Test Pits/Trenches : Fundamental Knowledge
Skill/Experience Level: Groundwater Monitoring/Recovery Well Installation: Working Knowledge
Skill/Experience Level: RCRA Facility Investigation : Fundamental Knowledge
Skill/Experience Level: Remedial Action Plan : Working Knowledge
Skill/Experience Level: Remedial Investigation : Working Knowledge
Skill/Experience Level: Risk Assessment : Fundamental Knowledge
Skill/Experience Level: Site Investigation : Working Knowledge
Skill/Experience Level: Soil-Gas Survey : Working Knowledge
Skill/Experience Level: Subsurface Investigation : Working Knowledge
Skill/Experience Level: Surveying : Working Knowledge
Skill/Experience Level: Topographic Survey : Working Knowledge
Skill/Experience Level: Trenching : Fundamental Knowledge
Category: SOLID WASTE SERVICES
Skill/Experience Level: Cell Construction : Fundamental Knowledge
Skill/Experience Level: Landfill Engineering Design : Fundamental Knowledge
Skill/Experience Level: Post Closure Monitoring/Reporting/O&M : Fundamental Knowledge
Skill/Experience Level: Radioactive and Mixed Waste : Fundamental Knowledge
Category: TREATMENT/REMEDIATION
Skill/Experience Level: Air Purging : Fundamental Knowledge
Skill/Experience Level: Bioremediation : Fundamental Knowledge
Skill/Experience Level: Contaminated Sediments : Fundamental Knowledge
Skill/Experience Level: Decontamination : Working Knowledge
Skill/Experience Level: Deep Well Injection : Fundamental Knowledge
Skill/Experience Level: Demolition : Working Knowledge
Skill/Experience Level: Dewatering : Fundamental Knowledge
Skill/Experience Level: Excavation : Working Knowledge
Skill/Experience Level: Groundwater Treatment : Working Knowledge
Skill/Experience Level: Hazardous Materials Cleanup : Fundamental Knowledge
Skill/Experience Level: Hazardous Waste Transportation : Working Knowledge

Skill/Experience Level: Mitigation Measures : Fundamental Knowledge
Skill/Experience Level: Natural Attenuation : Fundamental Knowledge
Skill/Experience Level: Oil/Water Separation : Fundamental Knowledge
Skill/Experience Level: Soil Vapor Extraction : Working Knowledge

Other Information

Languages

Language: Speak Read Write

English: Fluent, Fluent, Fluent

Years of Experience

Previous Employers: 0.00
CB&I: 6
Total of 6.00 year(s) experience

Experience in EPA Regions

Region 9 (AZ CA HI NV American Samoa, Guam, TT)

Industry Experience

Construction
Environmental
Transportation

(b) (6) [redacted]

(b) (6) [redacted]

CLICKSAFETY®

certifies that

NATALIE ROTHELL

has successfully completed

OSHA 30 Hour Construction

and has earned 3 IACET CEUs and 30.3 Contact Hours.

This course was developed and presented by ClickSafety.com, Inc.

CLICKSAFETY
Safety. Compliance. Your Future.
www.ClickSafety.com

AUTHORIZED IACET PROVIDER

I confirm that I personally took the course listed above.

16142536	4/1/2016	30.25 HOURS	
SERIAL NUMBER	COMPLETION DATE	COURSE DURATION	STUDENT SIGNATURE

As an Authorized OSHA Outreach Training Provider, ClickSafety verifies that this OSHA Outreach Training course was conducted in accordance with OSHA Outreach Training Program requirements. ClickSafety will document this class to the OSHA Authorizing Training Organization. Upon successful review of the documentation, ClickSafety will provide each student their DOL OSHA card within 90 days of the completion date of the OSHA course.

16142536

CLICKSAFETY®

certifies that

NATALIE ROTHELL

has successfully completed ClickSafety's web-based training course:

C3 Competent Person, Excavations

This course was developed and presented by ClickSafety.com, Inc.

I confirm that I personally took the course listed above.

16142537	1/11/2016	2.75 HOURS	
SERIAL NUMBER	COMPLETION DATE	COURSE DURATION	STUDENT SIGNATURE

16142537

Student Affiliation:
CB&I Federal Services
4433

Compliance Solutions
"Today's Training...Tomorrow's Solution"

3980 Quebec St., 2nd Floor, Denver CO 80207-1633 800-711-2706

Certificate of Completion

This is to certify that

Natalie Rothell

has been tested and successfully meets the training requirements for

8-Hour HAZWOPER Refresher
as per 29 CFR 1910.120(e)

Presented
Thursday, March 03, 2016

Compliance Solutions Occupational Trainers, Inc.

Neval Gupta
Vice President

Jeffrey E. Kline
President/CEO

Certificate Number: *754918495*

Student Affiliation:
CB&I Federal Services
4433

Compliance Solutions
"Today's Training...Tomorrow's Solution"

3980 Quebec St., 2nd Floor, Denver CO 80207-1633 800-711-2706

Certificate of Completion

This is to certify that

Natalie Rothell

has been tested and successfully meets the training requirements for

8-Hour HAZWOPER Refresher
as per 29 CFR 1910.120(e)

Presented

Thursday, January 29, 2015

Compliance Solutions Occupational Trainers, Inc.

Neval Gupta
Vice President

Jeffrey E. Kline
President/CEO

Certificate Number: *754894876*

Student Affiliation:
CB&I Federal Services
4433

Compliance Solutions
"Today's Training...Tomorrow's Solution"

3980 Quebec St., 2nd Floor, Denver CO 80207-1633 800-711-2706

Certificate of Completion

This is to certify that

Natalie Rothell

has been tested and successfully meets the training requirements for

8-Hour HAZWOPER Refresher
as per 29 CFR 1910.120(e)

Presented

Thursday, April 24, 2014

Compliance Solutions Occupational Trainers, Inc.

Neval Gupta
Vice President

Jeffrey Kline
President/CEO

Certificate Number: 754871781

This certificate is awarded to

Natalie Rothell

for the successful completion of the course

8-Hour HAZWOPER Refresher

as per 29 CFR 1910.120 (e) (8)

Hours: 8 Hours 0 Min Credits: 0

Completion Date: 2/21/2013

Jeffrey J. Guzzardo, CSP
HSE Training Manager, CB&I Federal Services

Compliance Solutions

"Today's Training... Tomorrow's Solution"

Studen [illegible]
Shaw Environm [illegible] *ucture*
[illegible]

3980 Quebec St, 2nd Floor Denver, CO 80207-1633 800-711-2706

Certificate of Completion

This is to certify that

Natalie Rothell

has been tested and successfully meets the training requirements for

8-Hour HAZWOPER Refresher

as per 29 CFR 1910.120(e)

Presented

Monday, February 20, 2012

Compliance Solutions Occupational Trainers, Inc.

Certificate Number: 754835297

Neval Gupta	Jeffrey Kline
Vice President	***President/CEO***

environmental
TRAINING CENTER

CUYAMACA
· COLLEGE ·

Environmental Training Center

Compliance ~ Workplace Safety ~ Emergency Response

40 HOUR HAZWOPER

Certificate is hereby granted to

Natalie Rothell

This certificate certifies the successful completion of the 40 Hour OSHA HAZWOPER course. This course satisfies the requirements for generalized employee training under OSHA 1910.120 and State of California Regulation 5192 Title 8.

December 18 , 2010

Tom Evans, Instructor

Jennifer Lewis, Director

Ron Peters, Instructor

www.SanDiegoETC.org

This is to certify that on December 18, 2010

Natalie Rothell

has successfully completed the 40 Hour HAZWOPER Training which satisfies OSHA requirements under (1910.120) and State of California Regulation 5192 Title 8. Issued by the Environmental Training Center.

Jennifer Lewis, Director

environmental
TRAINING CENTER

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

Natalie Rothell

SW9-02-12-00552

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

San Diego, California	10/25/12 - 10/26/12	SW9 - NAVFAC Southwest	Michael Haliburton PMP, PE
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
Kugan Panchadsaram	kugan@kugan.com	858-212-2941	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Gary F. Anderson

Director, USACE Learning Center

American Red Cross

Certificate of Completion

Natalie Rothell

has successfully completed requirements for

Adult First Aid/CPR/AED - valid 2 Years

conducted by

American Red Cross

Date Completed: **08/26/2015**

Instructors: **Sabrina E Elliott**

Certificate ID: 0XBC74

To verify, scan code or visit:
redcross.org/confirm

NOTIFICATION: THIS PAGE CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting a Person's Privacy

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YOU MAY APPEAL THIS DECISION

Based on the redaction, this constitutes a partial denial of your request. Because your request has been denied in part, you are advised of your right to appeal this determination in writing.

Please refer to the accompanying correspondence from the FOIA Office for directions and information about the appeal process.

This Certifies

Successful Completion Of The

24-Hour Fall Protection Competent Person Training

in accordance with the requirements of ANSI Z359
and the US Army Corps of Engineers EM 385-1-1

Natalie I. Rothell

Name

James O Vigerust Jr.

James Vigerust, FPS
CB&I Federal Services HSE Training Manager

February 23, 2017

Date

This certification is only valid for CB&I and its subsidiaries and is not to be relied upon by any other employers of the named individual.

Michael R. Lightner

Cell: 530-941-3738
Email: michael.lightner@aptim.com

Professional Qualifications

Mr. Lightner has over twelve years of professional experience working on various government and commercial environmental investigation and remediation projects throughout the continental United States. Past experience includes acting as site supervisor, technical lead, field manager, project geophysicist, project geologist, and site safety and health officer. Throughout his career, Mr. Lightner has developed a diverse skill set, and has provided hands-on experience in the form of technical oversight and implementation, coordination, and management.

Education

Bachelor of Science, Geology, University of California, Davis, Davis, California, [redacted]
Associate of Arts, General Education, Shasta College, Redding, California, [redacted]

Additional Training

8 Hour OSHA Hazardous Waste Operations Refresher, Aptim, 2017
Construction Quality Management for Contractors, CB&I Federal Services LLC, 2017
30 Hour OSHA Construction Safety Training, CB&I Federal Services LLC, 2016
Radiation Worker Training, CB&I Federal Services LLC, Naval Station Treasure Island, 2016
First Aid/CPR Training, CB&I Federal Services LLC, 2016
Radiation Worker Training, CB&I Federal Services LLC, Hunters Point Naval Shipyard, 2016
8 Hour OSHA Site Supervisor Training, CB&I Federal Services LLC, 2014
UXO/MEC Awareness Training, CB&I, Vandenberg Air Force Base, 2013
40 Hour MSHA Hazard Training, Zonge Geosciences, 2006
40 Hour OSHA Hazardous Waste Operations, Aerotek Engineering & Environmental, 2005

Experience and Background

01/2007 - Present

Scientist 2, APTIM (formerly CB&I Federal Services LLC), Concord, California

Mr. Lightner has acted as project geophysicist in a field supervisory role on various geophysical surveys, including unexploded ordnance surveys, utility location & clearance surveys, and seismic and resistivity surveys. Mr. Lightner has worked as a geologist, using various methods (including Air Rotary Casing Hammer, Mud Rotary, Hollow Stem Auger, Direct Push and Sonic) to install groundwater monitoring wells, soil vapor wells, and soil vapor extraction systems. Mr. Lightner has performed soil, soil vapor, and water sampling. Additionally, Mr. Lightner has acted as Technical Lead on a large scale Military Munitions Response Program project, the responsibilities for which consisted of the following: technical writing for documents such as Work Plans, After Action Reports, Explosives Siting Plans, Weekly and Daily Reports, and proposal and procurement documents; managing the excavation and transportation and disposal of lead impacted soil from a Small Arms Range; organizing short term and long term logistics in order to complete project work on time and on budget; managing field employees, including accompanying administrational tasks; working directly with USAF and USACE clients on a daily basis.

The following is a summary of key projects:

<u>Site Supervisor, Project Geologist/Geophysicist, Marine Corps Mountain Warfare Training Center, Bridgeport, CA, 05/2017-Present</u>
Landfill condition and capping assessment activities in support of landfill closure.

<u>Project Geologist, Marine Corps Base Camp Pendleton, CA, 03/2017-Present</u>
Installation of groundwater bioventing/biosparging system, and enhanced in situ bioremediation activities.

Site Supervisor, Site Safety and Health Officer, Naval Air Weapons Station China Lake, Ridgecrest, CA, 09/2016 – 12/2016
Visual Site Inspections at the Salt Wells Propulsion Lab in support of RCRA Facility Assessment.

Site Supervisor, Project Geologist, NASA Crows Landing Flight Facility, Crows Landing, CA, 06/2016-Present
Groundwater characterization and remediation through enhanced in situ bioremediation with recirculation, combined with monitored natural attenuation.

Project Geologist, Hunters Point Naval Shipyard, San Francisco, CA, 09/2015 - Present
Groundwater characterization and remediation through in situ bioremediation and soil vapor extraction.

Technical Lead, Vandenberg Air Force Base, Lompoc, CA, 04/2011 - 12/2015
Munitions and explosives of concern interim removal action at Vandenberg AFB in support of the USAF Military Munitions Response Program.

Awards/Client Commendations:
Project received "Exceptional" evaluation rating from USACE on Contractor Performance Assessment Reports.

Project Geophysicist, Fort Ord, Monterey, CA, 01/2007 - 04/2011
Investigation and cleanup of unexploded ordnance and military munitions.

Awards/Client Commendations:
Received Personal Choice Award, 2009.

Project Geophysicist/Geologist, Aerojet, Rancho Cordova, CA, 01/2007 - 01/2009
Groundwater investigation and characterization through groundwater and soil vapor monitoring.

12/2005 - 12/2006
Exploration Geophysicist, Zonge Geosciences, Sparks, Nevada
Various geophysical field surveys, including Induced Polarization and Controlled Source Audio-Frequency Magnetotellurics, in order to locate and/or track large deposits of ore, namely gold.

06/2005 - 12/2005
Field Technician, Aerotek Engineering and Environmental, Sacramento, California
Investigation and cleanup of unexploded ordnance and military munitions; contracted by Zonge Geosciences.

Summary of key projects:
Field Technician, Beale Air Force Base, Marysville, CA, 06/2005 - 12/2005

Accomplishments:
Sole field technician hired on by Zonge Geosciences at the completion of the project.

Publications
Martin Miele, Jeremy Flemmer, Tom Dobecki, Sandra Takata, Michael Lightner, *Synergistic Geophysical Techniques for Assessing Seepage Pathways in Earthen Levees*, Symposium on the Application of Geophysics to Engineering and Environmental Problems, Denver, CO, 2009

Languages
Spanish, moderate

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

Michael Lightner

SPK-USACE-02-17-00051

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

San Diego, CA	3/8/2017- 3/9/2017	SPK-USACE	Jonathan Revolinsky
Location	Training Dates	Instructional District/ NAVFAC	CQM-C Manager

Larry Smith	Jonathan.Revolinsky@usace.army.mil	916-557-7779	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Chief, USACE Learning Center

Last Updated: 05 Apr 2017

Amy C. Meldrum

Professional Qualifications
Ms. Meldrum has over two years of environmental consulting experience. She has analyzed radiological data and developed reports in support of designating materials as non-low-level radioactive waste. She has also analyzed radiological scan data to support efforts to identify and locate subsurface radioactive objects. She has also modeled various types of TENORM waste for worker risk assessment and landfill acceptance. She has also assisted as a technical reviewer of radiological waste packages for transuranic waste destined for WIPP. Additionally, Ms. Meldrum has been involved in projects associated with Environmental Impact Statements, Historical Site Assessments, EPA technical reports, and NIOSH EEOICPA Dose Reconstruction Technical Basis Documents. She has several years experience using radiological modeling codes and software, and has passed Part I of the ABHP Health Physicist Exam.

Education
Master of Science, Environmental Engineering - Environmental Health Physics, Clemson University, Clemson, South Carolina, [redacted]
Bachelor of Engineering, Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, Michigan, [redacted]

Additional Training/Continuing Education
Construction Quality Management for Contractors - #784, Colorado Springs, CO, 2016
FEMA IS-00003 Radiological Emergency Management, Vienna, VA, 2015
FEMA IS-00027 Orientation to FEMA Logistics, Vienna, VA, 2015
FEMA IS-00100.b Introduction to Incident Command System, Vienna, VA, 2015
FEMA IS-00120.a An Introduction to Exercises, Vienna, VA, 2015
FEMA IS-00130 Exercise Evaluation and Improvement Planning, Vienna, VA, 2015
FEMA IS-00230.d Fundamentals of Emergency Management, Vienna, VA, 2015
FEMA IS-00235.b Emergency Planning, Vienna, VA, 2015
FEMA IS-00301 Radiological Emergency Response, Vienna, VA, 2015
FEMA IS-00331 Introduction to Radiological Emergency Preparedness Exercise Evaluation, Vienna, VA, 2015
FEMA IS-00700.a National Incident Management System (NIMS) An Introduction, Vienna, VA, 2015
FEMA IS-00800.b National Response Framework, An Introduction, Vienna, VA, 2015
FEMA IS-00836 Nuclear/Radiological Incident Annex, Vienna, VA, 2015
24-Hour HAZWOPER, Vienna, VA, 2015
40-Hour MARSSIM Course, Oak Ridge, TN, 2015
American Board of Health Physics - Health Physics Exam Part 1, Baltimore, MD, 2014

Registrations/Certifications/Licenses
Construction Quality Management (CQM), 2016, Active, Nationwide, 11/2021

Experience and Background

10/2016 - Present
Project Scientist 3, CB&I Federal Services, Technical Services, Greenwood Village, Colorado

Analyzed radiological data for determination of Non-LLRW for soil and concrete materials, and to support the identification of subsurface radioactive objects, and prepared reports for these data. Modeled oil and gas field waste with TENORM for risk assessments and landfill acceptance, and assisted in the preparation of related technical documents.

The following is a summary of key projects:

Project Scientist, Alameda Building 5, 500519, Department of the Navy, Alameda, CA, 02/2017 - Present
Modeled the project scenario using the EPA Building Preliminary Remediation Goals (BPRG) Calculator to calculate Derived Concentration Guidelines.

Project Scientist, TI Site 12 TCRA/Kleinfelder, 500565, Kleinfelder, Treasure Island, CA, 11/2016 - Present
Review radiological data and prepare data packages for the release of concrete and soils as non-LLRW materials.

Project Scientist, Treasure Island Basewide, 500505, Department of the Navy, Treasure Island, CA, 10/2016 - Present
Analyzed previously collected radiological data to aid in the identification of subsurface radioactive objects.

01/2015 - 10/2016
Health Physicist, SC&A, Inc., Vienna, Virginia

Modeled oil and gas TENORM wastes for landfill acceptance and risk assessments. Provided technical support in the review of radiological documentation of wastes destined for WIPP for technical adequacy and completeness. Assisted in the development of various sections of an Environmental Impact Statement for an In-Situ Leach Uranium Mine in Wyoming, including socioeconomic and radiological impacts. Assisted in the review of technical basis documents used in dose reconstructions under the NIOSH EEOICPA program. Assisted in the development of EPA documents related to TENORM wastes. Developed a Historical Site Assessment for an EPA facility to be decommissioned.

Professional Affiliations

American Board of Health Physicists, Associate Member, 2014
Health Physicst Society, Member, 2012

Amy C. Meldrum

Title: Project Scientist 3
Employee Number: (b) (6)
Location: Greenwood Village, CO
Location2: Village Center Station
Business Unit: RAD Safety, Home
Company: APTIM Federal Services

Contact Information

Work Phone: 3034862560

Skills
Group: COMPUTER/INFORMATION TECHNOLOGY SPECIALTIES
Category: COMPUTER APPLICATIONS (User)
Skill/Experience Level: Adobe Acrobat : Working Knowledge
Skill/Experience Level: Adobe Illustrator : Fundamental Knowledge
Skill/Experience Level: GIS : Fundamental Knowledge
Skill/Experience Level: Internet : Working Knowledge
Skill/Experience Level: Microsoft Access : Fundamental Knowledge
Skill/Experience Level: Microsoft Excel : Working Knowledge
Skill/Experience Level: Microsoft Outlook: Working Knowledge
Skill/Experience Level: Microsoft Power Point : Working Knowledge
Skill/Experience Level: Microsoft Word : Working Knowledge
Skill/Experience Level: Windows Vista: Working Knowledge
Skill/Experience Level: Windows XP : Working Knowledge
Category: COMPUTER/GENERAL
Skill/Experience Level: Computers (desktops/laptops) : Working Knowledge

Group: CONSULTING SPECIALTIES
Category: ASSESSMENT/EVALUATION
Skill/Experience Level: Environmental Impact Statement : Fundamental Knowledge
Skill/Experience Level: Radiological Surveys : Working Knowledge
Category: HOMELAND SECURITY
Skill/Experience Level: Radiation Detection : Working Knowledge
Skill/Experience Level: Radiation Survey : Working Knowledge

Group: ENVIRONMENTAL SPECIALTIES
Category: ANALYTICAL
Skill/Experience Level: Data Management : Fundamental Knowledge
Category: REGULATORY
Skill/Experience Level: Clean Air Act : Fundamental Knowledge
Skill/Experience Level: Clean Water Act : Fundamental Knowledge
Skill/Experience Level: Code of Federal Regulations : Fundamental Knowledge
Skill/Experience Level: NEPA Compliance : Fundamental Knowledge
Skill/Experience Level: Nuclear Regulatory Commission : Fundamental Knowledge

Group: FIELD SERVICES SPECIALTIES
Category: SAMPLING
Skill/Experience Level: Air : Fundamental Knowledge
Skill/Experience Level: Sampling : Fundamental Knowledge
Skill/Experience Level: Soil : Fundamental Knowledge
Skill/Experience Level: Wipe : Fundamental Knowledge

Group: TECHNICAL SPECIALTIES
Category: HEALTH AND SAFETY
Skill/Experience Level: Health Physics : Working Knowledge
Category: MODELING
Skill/Experience Level: Air Dispersion Modeling : Fundamental Knowledge
Skill/Experience Level: Exposure Modeling : Fundamental Knowledge
Skill/Experience Level: Mathematical Modeling : Fundamental Knowledge
Category: NUCLEAR/RADIOLOGY
Skill/Experience Level: Analysis : Working Knowledge
Skill/Experience Level: Decontamination and Demolition : Fundamental Knowledge
Skill/Experience Level: Low-Level Radiation : Fundamental Knowledge
Skill/Experience Level: Radiation Detection : Working Knowledge
Skill/Experience Level: Radiation Dosimetry : Working Knowledge
Skill/Experience Level: Radiation Protection Training : Fundamental Knowledge
Skill/Experience Level: Radiation Risk Assessment : Fundamental Knowledge
Skill/Experience Level: Radiation Shielding Design : Fundamental Knowledge
Skill/Experience Level: Radiation Transportation Regulations : Fundamental Knowledge
Skill/Experience Level: Radioactive Safety/Monitoring : Fundamental Knowledge
Skill/Experience Level: Radioactive Waste Management : Fundamental Knowledge
Skill/Experience Level: Radiological Surveys : Working Knowledge

Other Information

Years of Experience

Previous Employers: 1.75
CB&I: 1
Total of 2.75 year(s) experience

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

Amy Meldrum

NWO-71-16-00210

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

Colorado Springs, CO	November 9 2016	NWO - Omaha District	Louis Richardson
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager
Chip L Kossow	chip.l.kossow@usace.army.mil	719-526-5448	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: https://www.myuln.net

Chief, USACE Learning Center
Jeffrey D. Dziedzic

Attachment 5
Outside Organizations

Outside Organizations

Organization Name/Address/Phone	Description of Services
TestAmerica	Environmental Analytical Services
JRM/Harris Blade/Indian Eyes	Equipment Rental Services

Attachment 6
Submittal Register

SUBMITTAL REGISTER	CONTRACT NUMBER N62473 15 D 0811 CTO N62473-17-F-4550
Title and Location: ***Radiological Work Tasks, Remedial Action and Maintenance of Remedies, Task: Basewide Radiological Support, Hunters Point Naval Shipyard, San Francisco, California*** — Contractor: Aptim Federal Services LLC	Specification Section Scope of Work

				Type of Submittal									Classification			Contractor Schedule Dates			Contractor Action			Government Action		
Transmittal No.	Item No.	Specification Paragraph No.	Description of Item Submitted	Data	Drawings	Instructions	Schedules	Statements	Reports	Certificates	Samples	Records	Information only	Government approved	Reviewer	Submit	Approval needed by	Material needed by	Code	Date	Submit to government	Code	Date	Remarks
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
	001	Section 7.0	Copy of NRC and CA License and SOPs					X		X			X											
	002	Section 7.0	MOU Modifications/Revisions		X			X						X										
	003	Section 7.0	Kickoff Meeting Minutes					X						X										Within 10 days of meeting
	004	Section 7.0	Monthly Status Reports					X					X											
	005	Section 7.0	Internal Draft Project Plans and SAP		X		X	X						X										
	006	Section 7.0	Draft Work Plan		X		X	X						X										
	007	Section 7.0	Final Work Plan		X		X	X						X										
	008	Section 7.0	Draft Radiological Protection Plan		X			X						X										
	009	Section 7.0	Final Radiological Protection Plan		X			X						X										
	010	Section 7.0	Draft Waste Management Plan		X			X						X										
	011	Section 7.0	Final Waste Management Plan		X			X						X										
	012	Section 7.0	Draft Abbreviated SAP		X			X						X										
	013	Section 7.0	Draft Abbreviated SAP		X			X						X										
	014	Section 7.0	Draft APP/SSHP		X			X						X										
	015	Section 7.0	Final APP/SSHP		X			X						X										

SUBMITTAL REGISTER

CONTRACT NUMBER
N62473 15 D 0811
CTO N62473-17-F-4550

Title and Location: ***Radiological Work Tasks, Remedial Action and Maintenance of Remedies, Task: Basewide Radiological Support, Hunters Point Naval Shipyard, San Francisco, California***

Contractor
Aptim Federal Services LLC

Specification Section
Scope of Work

				Type of Submittal									Classification			Contractor Schedule Dates			Contractor Action			Government Action		
Transmittal No.	Item No.	Specification Paragraph No.	Description of Item Submitted	Data	Drawings	Instructions	Schedules	Statements	Reports	Certificates	Samples	Records	Information only	Government approved	Reviewer	Submit	Approval needed by	Material needed by	Code	Date	Submit to government	Code	Date	Remarks
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
	016	Section 7.0	Radiological Waste Pile Tracking Table		X			X						X										Once every two weeks
	017	Section 7.0	Access Log									X	X											All contractors must sign before entering an RCA
	018	Section 7.0	Equipment Tracking Log									X	X											As needed
	019	Section 7.0	Equipment Calibration Records									X	X											As needed
	020	Section 7.0	Portal Monitor Setup and Daily Tests									X	X											As needed
	021	Section 7.0	Truck Survey Logs									X		X										Submit survey alarms to Navy/RASO immediately
	022	Section 7.0	Portal Monitor Summary Report	X				X				X		X										Monthly
	023	Section 7.0	Annual Dosimeter Report	X				X				X	X											Provide to individuals
	024	Section 7.0	Task-Specific Work Instructions	X	X	X		X				X		X										As needed

Attachment 7
Testing Plan and Log

Testing Plan and Log

Contract No. N62473-17-D-0006 Contract Task Order N62473-17-F-4550			Hunters Point Naval Shipyard San Francisco, California							Contractor APTIM	
Specification Section and Paragraph Number	Test Procedure	Test Name	Accredited/ Approved Laboratory		Sampled By	Location of Test On Site or Off Site		Frequency of Test	Date Completed	Date Forwarded to Contracting Officer	Remarks
			Yes	No							
*											

Notes:

** Analytical testing requirements are provided in the Abbreviated Sampling and Analysis Plan (Appendix B of the Work Plan).*

APTIM APTIM Federal Services, LLC

Attachment 8
Definable Features of Work Matrix

Definable Features of Work Matrix
CONTRACTOR QUALITY CONTROL PLAN
Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California
Contract Number N62473-17-D-0006
Contract Task Order N62473-17-F-4550

Plan/ Specification Section	Schedule Cross Reference	Feature of Work	Task Lead	Preparatory	Initial	Follow-Up	Completion
Work Plan/2.2, 2.4	W.E. 6	Radiological Controls and Postings	Minh Chi	Barbara Matz	Barbara Matz	Randall Killpack	Minh Chi
Work Plan/2.3	W.E. 6	Radiological Surveys	Minh Chi	Barbara Matz	Barbara Matz	Randall Killpack	Minh Chi
Work Plan/2.5, 2.6	W.E. 6	Radiological Support to Other Contractors	Minh Chi	Barbara Matz	Barbara Matz	Randall Killpack	Minh Chi
Work Plan/2.7	W.E. 6	Incoming and Outgoing Surveys	Minh Chi	Barbara Matz	Barbara Matz	Randall Killpack	Minh Chi
Work Plan/2.1	W.E. 6	Portal Monitor Operation and Truck Wash	Minh Chi	Barbara Matz	Barbara Matz	Randall Killpack	Minh Chi
Work Plan/2.5, 2.7	W.E. 6	Decontamination and Release of Equipment and Tools	Minh Chi	Barbara Matz	Barbara Matz	Randall Killpack	Minh Chi

Notes:
W.E. *work element*

Attachment 9
Organization and Personnel Certifications

Organization and Personnel Certifications Log
Definable Features of Work Matrix
CONTRACTOR QUALITY CONTROL PLAN
Basewide Radiological Support
Hunters Point Naval Shipyard
San Francisco, California
Contract Number N62473-17-D-0006
Contract Task Order N62473-17-F-4550

Definable Feature of Work	Certification Requirement	Code	Organization	Individual	Verified by/Date Verified	Certificate Expires
All Project Tasks	40-Hour Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response, including 8-Hour Refresher	P	APTIM	(all personnel)		
Lab Analysis	U.S. Department of Defense Environmental Laboratory Accreditation Program	S				

Legend:

Column 1, Definable Feature of Work: Refer to Construction Quality Control Plan table for list of definable features of work. List in order.

Column 2, Certification Requirement: State the certification required for the subcontractor, supplier, and/or individual.

Column 3, Code: S = Certificate required for the firm, that is, subcontractor or supplier; P = certificate required for the person performing the work.

Column 4, Organization: Subcontractor or supplier organization name.

Column 5, Individual: Name of certified individual (note: if certification requirement only applies to the firm, note name of person who provided certificate).

Column 6, Verified By/Date Verified: APTIM individual who verified certificates for organization and/or individuals. Verification required no later than Preparatory Inspection.

Column 7, Certificate Expires: Note the certificate expiration date.

Notes:

This log will be included in the Construction Quality Control Plan as an appendix with columns 1, 2, and 3 are filled in. Remaining columns will be completed when information becomes available.

APTIM *AptimFederal Services, LLC*

Attachment 10
Procedures
(provided on electronic copy only)

Naval Facilities Engineering Command

NOTIFICATION: **THIS PAGE CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT**

FOIA Exemption 4 (5 USC 552(b)(4))
Privileged / confidential trade secrets, commercial, financial information

Pages 424 to 536

YOU MAY APPEAL THIS DECISION

Based on the redaction, this constitutes a partial denial of your request. Because your request has been denied in part, you are advised of your right to appeal this determination in writing.

Please refer to the accompanying correspondence from the FOIA Office for directions and information about the appeal process.